TREASURY
Bureau of Statistics

ECONOMIC MULTIPLIERS FOR

ALBERTA INDUSTRIES AND COMMODITIES

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PREFACE

This publication presents economic multipliers - household income, Gross Domestic Product (G.D.P.) at factor cost, employment and output - for the Alberta economy. These multipliers provide measures of the effects on the economy of changes in final demand. Included in this publication are multiplier tables for both closed and open models. For each of these models, multipliers have been calculated with and without leakages from domestic production for both industries and commodities. All multiplier tables have been derived from the 1974 Alberta input-output tables. Users are requested to refer to our publication entitled, The Input-Output Structure of the Alberta Economy, 1974, for details on industry and commodity classifications and input-output model descriptions. The level of detail presented in this report is by no means the only data available from the 1974 Input-Output Tables. If users require alternate aggregations for industries or commodities, or other types of multipliers, the Alberta Bureau of Statistics is prepared to provide such tables, subject to availability. If there are any questions or comments regarding the data in this publication, please contact:

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INTRODUCTION

When there is a change in the economy (business opening/closing/expanding/contracting, changes in the demands for a commodity, tax changes, interest rate shifts, etc.), it impacts first on those firms, households and/or governments most directly involved. Then there is a ripple effect as this impact spreads through the economy affecting other firms, households and governments. Multipliers provide the tool whereby the total impact on the economy - on income, employment, gross domestic product (GDP) and gross output - can be measured.

This publication presents a set of multipliers for Alberta produced from the 1974 Alberta input-output tables[1], contained in the Bureau of Statistics publication The Input-Output Structure of the Alberta Economy, 1974. The next section presents a number of situations where multiplier analysis can be applied. This is followed by a description of the multipliers in this publication. These various descriptions, coupled with the examples of multiplier use which are provided in the subsequent section, should assist users to choose the multipliers which best meet their needs. The final section sets out cautionary notes to be kept in mind when using multipliers.

In addition, information on data sources, methodology, a mathematical description of the models used, and additional multipliers are provided in the appendices.

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[1] An internal study of the multipliers from Canada input-output tables for 1966 and 1974 showed reasonable stability over time for multipliers, suggesting that the values presented in this publication could be applied to other years.

APPLICATIONS OF MULTIPLIERS

Either by themselves or in conjunction with other economic tools, multipliers can be a useful component in the decision-making process. The applications set out below, while not an exhaustive list, do indicate the broad range of economic situations where multipliers can provide a useful input.

1. Economic Development

(a) Establishment of additional firms; expansion, contraction or closure of existing firms.

The positive or negative impact of such changes on employment, income, G.D.P. (at factor cost) and gross output can be measured by using the appropriate industry multipliers. The temporary impact of any construction phase associated with a new or expanding firm can also be analyzed by applying construction industry multipliers.

(b) Decisions on which industries to encourage to locate in Alberta.

Multipliers for various industries can be compared to see which have the greatest impact on Alberta employment, income, etc. Coupled with information derived from feasibility studies relating to resource availability, viable industry size, cost competitiveness, etc., the impact data provide valuable input to the decision of which industries would most benefit the province.

(c) Import substitution strategies.

Some multipliers are derived under the assumption that all demands are met with goods produced by industries within the province. Other multipliers reflect the actual situation by allowing demands to be met

not only with goods produced by Alberta industries, but also with imports, government production and depletion of inventories. Of these three sources of leakages, imports are usually the major (and often only) contributor.

Thus, comparing the above two categories of multipliers (those with leakages and those without) provides an indication of the impact of imports, by industry or commodity, on the Alberta economy. Such information, in conjunction with the level of imports and the feasibility of producing more in the province, provides valuable input into the study of import substitution.

2. Fiscal and Monetary Policy Analysis

Multipliers also play an important part in measuring the full impact on the economy of fiscal and monetary policies or changes (e.g., changing interest rates).

The initial effect of such changes on final demand components (such as consumer expenditure, private and public investment and government current expenditure), broken down by commodity and industry, is estimated through various econometric modelling techniques. The appropriate commodity and industry multipliers are then applied to determine the full impact on the economy of the fiscal or monetary policy change.

3. Commodity Demand Studies

Multipliers also can contribute to analyses attempting to measure the impact of such activities as the levying of excise taxes on particular commodities, subsidizing the prices of certain goods, and export promotion activities such as removing export charges or finding new markets.

Again, econometric modelling would be used to estimate the initial changes in demand (either positive or negative) for the various commodities affected. The appropriate commodity multipliers would then be applied to estimate the total impact in the Alberta economy.

DESCRIPTION OF TYPES OF MULTIPLIERS[1]

The different multipliers presented in the publication are described in this section. The description basically falls into two parts - the measures used to indicate the impact of any economic change and the ways in which these measures are derived. Since the measures can be derived under different assumptions a number of separate multipliers result. Thus, a user must be careful to ensure the multiplier chosen is the appropriate one for the situation under consideration.

Four different ways of measuring the impact of economic change are presented in this publication, namely the impact on household income, G.D.P. (at factor cost), employment and gross output. Multipliers for each of these four measures are found in all tables. Except for absolute employment multipliers, the interpretation of a multiplier value is basically consistent for all multipliers. The multiplier gives the impact of a unit change in the causal factors (e.g., if a $1 change in industry output or commodity demand results in a $2 impact on G.D.P., the multiplier would be 2.0). For absolute employment multipliers, the figure measures the total impact on number of jobs for every change of $10,000 (in constant 1974 dollars) in an industry's output (industry multipliers) or in the demand for a commodity (commodity multipliers).

To estimate the multipliers, two basic input-output models - open and closed - are used. Multipliers calculated from the closed input-output model are called "total multipliers", while those from the open model are termed "simple multipliers". When there is a change in the economy (e.g., a production increase in an industry or increased demand for a commodity), the resulting effects can be thought of as emanating out in two ways - a direct and indirect industry effect and an induced income effect. When an industry

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[1] Appendix II provides a more detailed explanation of the various multipliers.

increases its output, it must obtain more inputs which are provided by other industries. The expansion of these other industries means increased demands are placed on their suppliers, and so on through a chain of interdependent industries. This can be referred to as the industry effect. In addition, as industries increase their production, they increase staff and thus pay more in wages. This increased income in the hands of consumers can generate additional consumption and subsequent resulting increases in industry outputs. This may be referred to as the income effect.

The closed model (i.e., total multipliers) captures both the industry and income effects; the open model (simple multipliers) includes only the industry effect. Because they do not measure the full impact of economic change, simple multipliers have only limited use and these tables have been included as Appendix IV. Total multipliers are presented in the main text.

For each of the two models (open and closed), multipliers can be derived either for industries or commodities, with or without leakages and in the absolute or ratio form. The various combinations result in twelve total and twelve simple multiplier tables in the publication.

With respect to industries and commodities, various levels of aggregation are possible. Two levels - major and detailed - (corresponding to the small and medium aggregations provided in the earlier Input-Output publication) - are presented for each of commodities and industries.

Increased demand can be met by Alberta industry produced goods (i.e., domestic production), imports, withdrawals from inventory and government production. The latter three are referred to as leakages from domestic production (i.e., demand which is met by other than Alberta industry produced goods). To the extent these sources supplant domestic production in the supply of a commodity, the impact of an increase in final demand on domestic industries will be reduced.

Multipliers are derived with leakages (i.e., reflecting the actual situation) and without leakages (i.e., under the assumption that all demand is met by domestic production). Comparing a multiplier derived without and with leakages indicates the impact of the leakages on the economy for that particular industry or commodity. Imports are usually the major (and often only) leakage. Thus, if an industry or commodity has a much higher multiplier without leakages than it does with leakages, it is reasonable to assume for most cases that any increase in final demand is met largely through imports rather than domestic production.

Finally, multipliers may be expressed in either the absolute or ratio form. For absolute multipliers, impacts on household income, employment, etc. are based on changes in the output of an industry or the demand for a commodity, i.e., output or demand is the causal factor generating change. For ratio multipliers (also known as traditional multipliers), the causal variable is different for each impact with both cause and impact being measured in the same dimensions. These ratio multipliers show, for example, the total impact on household income in the economy resulting from a change in the contribution to household income by an industry, the total impact on employment in the economy as a result of a change in employment in a given industry, etc. An example should clarify the conceptual difference between these two forms of multipliers. Table 2 (line 4) gives an absolute household income multiplier of .358 for mines, quarries and oil wells, meaning that a $1 million change in the industry's output would change total household income in Alberta by $0.358 million. Table 4 (line 4) shows the comparable ratio multiplier - 3.066 - for household income for the same industry. Thus, if the industry adds $1 million to household income (for example, through higher payrolls), total household income in the province would increase by $3.066 million. As the example illustrates, for absolute multipliers the cause (a change in output) is not in the same terms as the impact (change in household income); for ratio multipliers both cause and impact are expressed in the same terms (i.e., household income in this example).

In comparing absolute and ratio multipliers, it should also be noted:

1. Gross output multipliers are identical for both (e.g., the figure 2.144 is found in both Tables 2 and 4 for mines, quarries and oil wells). As discussed earlier, the impacts measured by absolute multipliers are based on changes in output. The nature of ratio multipliers (i.e., both cause and effect measured in the same dimensions) means that the gross output ratio multiplier also is based on a change in output. Thus, in the absolute and ratio forms, identical gross output multipliers result.

2. Because the causal factors for ratio multipliers (i.e., change in household income, employment, etc.) are essentially industry related, such multipliers are not meaningful for commodities. Absolute multipliers, however, are available for both industries and commodities.

3. As pointed out in the Cautionary Notes section, an adjustment for price changes since 1974 is necessary when using absolute employment multipliers; no such adjustment is required for ratio employment multipliers.

4. Also, as indicated in the Cautionary Notes, distorted ratio multipliers can result for a highly vertically integrated industry which uses arbitrary valuation methods in transferring product from one level to another.

The schematic on the following page shows the closed model (i.e. total) multipliers presented in the main body of the publication. The same grouping also applies for the open model (i.e., simple) multipliers presented in Appendix IV.

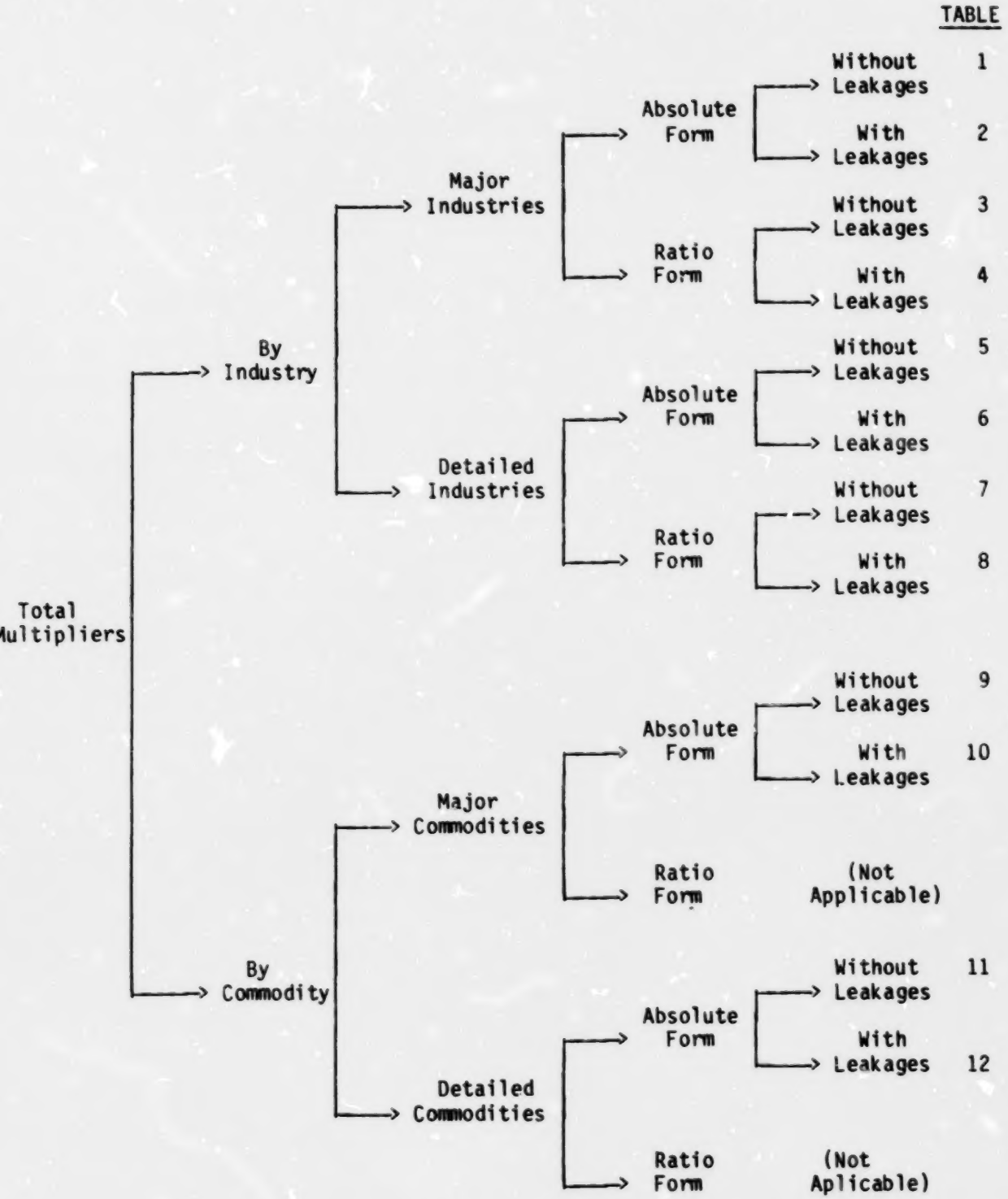
TABLE
Total Multipliers
By Industry
By Commodity
Major Industries
Detailed Industries
Major Commodities
Detailed Commodities
Absolute Form
Ratio Form
Without Leakages
With Leakages
1
2
3
4
5
6
7
8
9
10
(Not Applicable)
11
12
(Not Aplicable)

EXAMPLES OF USE

This section briefly illustrates the use of multipliers as a component (on either the cost or benefit side) in the decision making process. More detailed studies can be done as the user becomes more familiar with multiplier analysis.

Choosing the correct multiplier(s) to use in a particular situation requires deciding:

(a) How the impact of the economic change is to be measured, i.e., on income, employment, gross domestic product and/or gross output.

(b) What multiplier table(s) to use. This requires deciding upon simple or total multipliers, absolute or ratio form, with or without leakages, for industries or commodities and the level of detail for the industry or commodity. To simplify this decision process, it should be remembered:

(i) As mentioned previously, applications based on simple multipliers are limited for most users. Thus, the examples in this publication will deal only with total multipliers.

(ii) Multipliers which take leakages into account are more reflective of the actual situation and thus more frequently used than the "without leakage" multipliers.

(iii) When the causal factor is a change in production output, industry multipliers are used. When it is decided to measure the impact of a change in the demand for a commodity, commodity multipliers are the appropriate ones.

The following examples are only a small indication of the use of multiplier analysis. They illustrate how different multipliers can be used. More complex or detailed analyses are possible as a user becomes more familiar with multipliers.

1. Economic Impact of A New Plant

Suppose a chemical plant costing $100 million to construct and with a projected annual output of $20 million is to be built in Alberta. Both the temporary construction impact and the longer run production impact should be considered. For such analyses, Tables 2 and 6 (depending on the industry detail required) provide the appropriate multipliers because:

(a) Absolute (rather than ratio) multipliers for industries (rather than commodities) are used when the changes ($100 million and $20 million) are expressed as industry output.

(b) To reflect the actual situations, the "with leakage" multipliers are appropriate.

Table 6 provides the multipliers to assess both the construction and production impacts. The construction industry also appears in Table 2. However, as pointed out in the Cautionary Notes section, when the same industry appears in both the major and detailed tables, the multipliers from the latter should be used.

From Table 6, line 29, the economic impact (direct, indirect and induced effects) of the $100 million construction phase would be an increase of $68.1 million ($100 x 0.681) in household income, $94.6 million ($100 x 0.946) in G.D.P. at factor cost, and $268.9 million ($100 X 2.689) in gross output. Interpreting the employment multiplier of 0.570 is a little more complicated. Absolute employment multipliers measure the total impact on the number of jobs for every change of $10,000 (in constant 1974 dollars) in an industry's output. Thus, the current dollar output must first be converted to 1974 dollars, with appropriate inflation factors, before using the absolute employment multipliers. For example, if the $100 million construction cost was equivalent to $40 million in 1974 dollars, the impact would be a total increase of 2280 jobs --

$$\frac{\$40,000,000}{10,000} \text{ X } 0.570$$

The above figures provide the temporary impact on the economy during the construction period.

The annual economic impact of the $20 million chemical plant output is obtained from Table 6, line 27, i.e., increases of $9.1 million ($20 X 0.454) in household income, $17.1 million ($20 X 0.857) in GDP and $49.1 million ($20 X 2.455) in gross output. Once the $20 million output was expressed in 1974 dollars, the employment impact could be determined using the 0.386 employment multiplier. If, for example, this was $8 million in 1974 dollars, the impact would be an increase of 310 jobs --

$$\frac{\$8,000,000}{10,000} \text{ X } 0.386$$

Sometimes it may be more practical to express a new development in terms of the jobs and/or payroll to be created instead of output. Suppose the new chemical plant had been described not in terms of output (i.e., $20 million) but rather in terms of projected employment and/or annual payroll - for example employment of 100 and annual payroll of $3.5 million. To ascertain the economic impact in such a situation (i.e., when the factors of production, rather than output, are specified) ratio, rather than absolute, industry multipliers are used.

From Table 8, line 27, the impacts can be determined as a total increase of 310 jobs (100 X 3.108) and an increase of $8.8 million in household income ($3.5 X 2.503). Had the contribution of the chemical plant to G.D.P. been known, the multiplier, 2.387, could have been used to calculate the overall impact on G.D.P.

It is interesting to note that the nature of ratio multipliers (i.e., industry contribution and total economic impact are being measured in terms of the same variable) means the impact on jobs can be determined without discounting to 1974, which is necessary for the absolute multipliers.

2. Economic Impact of a Plant Closure

Multipliers can be used in both directions, i.e., to measure the impact of contractions, as well as expansions. The same approach, as in example 1 above, only in a negative sense would be applied. Thus, the closure of a chemical plant similar to that in the previous example would result in a total economic impact of a loss of over 300 jobs, and decreases of about $9 million in household income, $17 million in G.D.P. and $49 million in gross output.

3. Encouraging Industries to Locate in Alberta

Similar analyses to those for the chemical plant can be done for other industries. For example Table 6, line 8 shows that a $20 million expansion in the meat and poultry products industry would increase household income by $15.5 million, G.D.P. by $21.9 million, gross output by $71.6 million and the number of jobs by 614 (assuming the same deflation factor as for the chemical plant example).

This impact data, when utilized in conjunction with information on such factors as resource availability, viable industry size and cost competitiveness, can be most valuable in deciding which industries would most benefit the province.

4. Import Substitution

As explained earlier, multipliers can be derived either with or without leakages. The latter assumes that all demands are met with goods produced by industries in Alberta. Multipliers with leakages reflect the actual situation by allowing demands to be met not only with goods produced by Alberta industries but also with imports, government production and depletion of inventories. As indicated previously, of the three, imports are by far the most significant.

Comparing the corresponding with and without leakage multipliers for an industry or a commodity indicates the impact of the leakages on the economy. To facilitate such comparisons, the corresponding without and with leakage tables are placed next to each other in the publication (i.e., Tables 1 and 2, 3 and 4, etc.).

For example, the corresponding household income multipliers for the manufacturing industry (line 5 in Tables 1 and 2) are 1.028 (without leakages) and .586 (with leakages). Thus, if the output of the manufacturing industry was to increase by $1 million, household income would increase by $1.028 million assuming no leakages and by $0.586 million with leakages. The difference - $0.422 million - is a comparative measure of the impact of leakages. The similar comparative measure for mines, quarries and oil wells (line 4, Tables 1 and 2) is $0.156 million.

Similar comparisons for commodities can also be made using Tables 9 and 10 or 11 and 12 depending on the commodity level detail required. For example, the electrical and communications products (lines 23, Tables 9 and 10) household income multipliers are 1.003 without leakages and .070 with leakages. Thus, if the demand for these commodities was to increase by $1 million, household income would increase by $1.003 million if there were no leakages and by only $0.070 million with leakages. The difference of $0.933 million is a comparative measure of the impact of leakages. Similarly, the comparative measure for cement and concrete products (line 46, Tables 11 and 12) is $0.419 million.

As the major (and in many cases, only) contributor to leakages is imports, the difference between multipliers with and without leakages is basically a comparative indicator of the impact of imports, by industry or commodity, on the Alberta economy. These comparative impact measures, when coupled with such information as the level of imports for an industry or commodity and the feasibility of producing more in Alberta, provide valuable input into any study of import substitution for the province.

When comparing differences between multipliers with and without leakages, it should be remembered:

(a) Although either absolute or ratio multipliers can be used (depending on how the information is specified), the calculated differences are not directly comparable between the two forms of multipliers.

(b) As indicated in point 5 of the Cautionary Notes (next section) in this publication, leakages are different between industry and commodity multipliers. The former have been derived to include only leakages at the intermediate demand stage while commodity multipliers include leakages at both the intermediate and final demand stages.

5. Export Promotion

Suppose expanded marketing efforts result in an increase of $100 million of coal exports from Alberta. The impact of an increase in the demand for a commodity should be measured by commodity multipliers. When looking specifically at the impacts resulting from changes in the level of exports, the assumption is made that all goods exported have been produced in Alberta. In other words, any goods imported into Alberta are consumed in the province and thus cannot be part of any exports. In multiplier analysis, this means there can be no leakages at the final demand stage (although leakages at the intermediate demand level are appropriate).

The with leakages multipliers in this publication have been derived to include leakages at the final demand stage (as well as at the intermediate demand level). This makes them unsuitable for measuring the impact of changes in the export levels of commodities. However, it should be noted that suitable commodity multipliers (that do not allow final demand leakages) can be derived and are available from the Alberta Bureau of Statistics on request.

Since the industry multipliers in this publication are derived on the basis of intermediate demand leakages only, is there any situation in which they

can be used for the analysis of export changes? In the case where the commodity in question is produced only by one inudstry, then industry multipliers can be used since they are identical to the commodity multipliers dervied with the same assumptions of demand leakages.

Since coal comes from one industry (coal mines), the impact of the $100 million increase in exports can be determined from Table 6, line 4. Household income will increase by $39.6 million, G.D.P. by $98.9 million and gross output by $213.9 million. If the $100 million was equivalent to $40 million in 1974 dollars, the impact on employment would be an increase of 1,260 jobs --

$$\frac{40,000,000}{10,000} \times 0.316$$

By comparison, had the commodity multipliers for coal (Table 12, line 6) mistakenly been used, the impacts calculted would have been increases of $38.2 million in household income, $95.5 million in G.D.P., $206.4 million in gross output and 1,220 in jobs. These impacts are lower than those calculated above from the industry multipliers because of the effect of final demand leakages. The exports of Alberta produced coal (and the resulting impact on the economy) are lessened because of leakages, (i.e., imported coal which became part of the exports).

CAUTIONARY NOTES

Before using the multipliers presented in this publication, the following cautions should be noted:

1. The multiplier values are based on a simple static input-output model, which assumes capacity exists to meet any increase in demand for goods. For any situation where an increase in demand can only be met by increasing capacity (i.e., resulting in a demand for capital expansion), the actual impact on the economy would be higher than that indicated by the multipliers in this publication.

2. The multipliers are based on the average production technology and expenditure patterns embodied in the 1974 Alberta input-output tables. Any significant changes in production technology and/or expenditure patterns could lead to changes in the multiplier values. Expenditure pattern changes could be caused by such factors as shifts in consumer preferences, changes in the tax structure, etc.

3. The multipliers in this publication have not been adjusted for price changes since 1974. For ratio multipliers this does not create a problem since the method of deriving them results in their not being influenced singificantly by price changes over longer periods. The income, G.D.P. and gross output absolute multipliers also are not significantly affected, assuming that price changes for these factors parallel those for commodities and industry output. This is not an unreasonable assumption in most cases. It is the absolute employment multiplier where the effect of price changes is significant. Adjustments for price changes have to be made before employing these multipliers (as illustrated in the Examples section).

4. For an industry (e.g., petroleum and coal products) which is highly verticially integrated and uses arbitrary valuation methods in transferring product from one level of the industry to another (e.g., crude petroleum

transferred to refineries), the ratio multipliers for income, employment and G.D.P. can be distorted and should be used with caution. If the value attached to the product being transferred from one level to another in the integrated industry is arbitarily high, the resulting ratio multipliers (because of the way these multipliers are calculated) overstate the impact.

5. Multipliers can be derived with or without leakages. For the former, the leakages may be at the intermediate demand stage or at both the intermediate and final demand stages.[1] When using multipliers with leakages, one must always be aware of what leakages have been included so as not to misuse the multipliers. With a view to making them applicable to as many different situations as possible, the industry with leakage multipliers in this publication have been derived to include intermediate demand leakages only while the commodity with leakage multipliers include both intermediate and final demand leakages. As pointed out in the Examples section, one area where such commodity multipliers are not appropriate is when considering the impact of increased exports.

6. Some industries (e.g., agriculture, forestry, communications) are common to both the major industry and detailed industry multiplier tables. Similarly, some commodities (e.g., live animals, forestry products, beverages) are found in both the major and detailed commodity multiplier tables. In such cases, the multiplier values are somewhat different between the two levels of aggregation. Where this occurs, the multipliers for the more detailed level should be used. Multipliers based on a larger input-output table (i.e., more detailed) are considered to be more accurate because the larger the table the easier it is to take into account the interdependencies among industries.

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[1] To produce goods and services, industries require input goods and services. For example, the agriculture industry uses gasoline, fertilizers, machinery, etc. to produce grain, live animals and other agricultural products. When the goods and services are being demanded for the production process (e.g., gasoline, fertilizers, etc. in the above example), this is known as intermediate demand. When goods and services are being demanded by final consumers (including government) for ultimate consumption (and not as part of the production process) this is final demand.

TABLES

TOTAL MULTIPLIERS BY INDUSTRY

TABLE 1. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	1.242	1.795	1.209	4.571
2	FORESTRY	1.105	1.644	1.462	4.902
3	FISHING, HUNTING AND TRAPPING	1.095	1.691	1.168	3.714
4	MINES, QUARRIES AND OIL WELLS	.514	1.281	.405	2.855
5	MANUFACTURING	1.028	1.641	.987	4.827
6	CONSTRUCTION	1.089	1.628	.966	4.657
7	WHOLESALE AND RETAIL TRADE	1.199	1.731	1.356	4.338
8	TRANSPORTATION AND STORAGE	.976	1.560	.987	4.113
9	COMMUNICATIONS	.962	1.591	.997	3.644
10	UTILITIES	.880	1.526	.671	3.350
11	FINANCE, INSURANCE AND REAL ESTATE	.647	1.334	.460	2.876
12	COMM., BUS. AND PERSONAL SERVICES	1.162	1.712	1.283	4.342
13	DUMMY INDUSTRY I (1)	.982	1.513	1.006	5.205
14	DUMMY INDUSTRY II (2)	.943	1.467	.978	4.885
15	TRANSPORTATION MARGINS (3)	.976	1.560	.986	5.112
16	HOUSEHOLDS (4)	.680	1.082	.669	3.776

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE 2. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	.885	1.224	.865	2.941
2	FORESTRY	.736	1.054	1.099	3.221
3	FISHING, HUNTING AND TRAPPING	.852	1.303	.934	2.610
4	MINES, QUARRIES AND OIL WELLS	.358	1.021	.259	2.144
5	MANUFACTURING	.586	.937	.561	2.827
6	CONSTRUCTION	.652	.928	.545	2.654
7	WHOLESALE AND RETAIL TRADE	.905	1.260	1.073	3.001
8	TRANSPORTATION AND STORAGE	.691	1.103	.711	2.816
9	COMMUNICATIONS	.722	1.207	.764	2.558
10	UTILITIES	.687	1.216	.486	2.473
11	FINANCE, INSURANCE AND REAL ESTATE	.487	1.076	.306	2.147
12	COMM., BUS. AND PERSONAL SERVICES	.851	1.216	.983	2.928
13	DUMMY INDUSTRY I (1)	.383	.557	.429	2.445
14	DUMMY INDUSTRY II (2)	.341	.826	.586	3.062
15	TRANSPORTATION MARGINS (3)	.624	.996	.642	3.542
16	HOUSEHOLDS (4)	.367	.581	.366	2.349

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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TABLE 3. TOTAL MULTIPLIERS (RATIO FORM, WITHOUT LEAKAGES) BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	2.354	2.739	2.349	4.571
2	FORESTRY	3.712	4.455	2.375	4.902
3	FISHING, HUNTING AND TRAPPING	1.886	1.950	1.761	3.714
4	MINES, QUARRIES AND OIL WELLS	4.408	2.261	6.594	2.855
5	MANUFACTURING	5.734	5.804	6.039	4.827
6	CONSTRUCTION	3.286	4.064	4.383	4.657
7	WHOLESALE AND RETAIL TRADE	2.224	2.595	1.901	4.338
8	TRANSPORTATION AND STORAGE	3.010	3.032	2.860	4.113
9	COMMUNICATIONS	2.258	2.142	2.152	3.644
10	UTILITIES	2.069	1.970	2.817	3.350
11	FINANCE, INSURANCE AND REAL ESTATE	2.416	1.847	4.553	2.876
12	COMM., BUS. AND PERSONAL SERVICES	2.335	2.628	2.041	4.342

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE 4. TOTAL MULTIPLIERS (RATIO FORM, WITH LEAKAGES) BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	1.678	1.868	1.681	2.941
2	FORESTRY	2.471	2.855	1.785	3.221
3	FISHING, HUNTING AND TRAPPING	1.468	1.502	1.408	2.610
4	MINES, QUARRIES AND OIL WELLS	3.066	1.803	4.216	2.144
5	MANUFACTURING	3.267	3.315	3.432	2.827
6	CONSTRUCTION	1.968	2.318	2.474	2.654
7	WHOLESALE AND RETAIL TRADE	1.679	1.889	1.504	3.001
8	TRANSPORTATION AND STORAGE	2.130	2.143	2.062	2.816
9	COMMUNICATIONS	1.694	1.624	1.650	2.558
10	UTILITIES	1.615	1.569	2.039	2.473
11	FINANCE, INSURANCE AND REAL ESTATE	1.818	1.490	3.031	2.147
12	COMM., BUS. AND PERSONAL SERVICES	1.710	1.865	1.564	2.928

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TABLE 5. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY DETAILED INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	1.246	1.793	1.230	4.586
2	FORESTRY	1.097	1.634	1.478	4.850
3	FISHING, HUNTING AND TRAPPING	1.096	1.690	1.188	3.712
4	COAL MINES	.619	1.340	.536	3.121
5	PETROLEUM AND GAS WELLS	.468	1.246	.372	2.733
6	OTHER MINES AND QUARRIES	.846	1.501	.711	3.725
7	SERVICES INCIDENTAL TO MINING	1.139	1.699	.919	4.123
8	MEAT AND POULTRY PRODUCTS INDUSTRY	1.212	1.763	1.202	5.432
9	DAIRY FACTORIES	1.213	1.762	1.228	5.264
10	MISC. FOOD INDUSTRIES	1.170	1.728	1.176	5.414
11	BEVERAGE INDUSTRIES	.999	1.580	.978	4.568
12	RUBBER INDUSTRIES	1.032	1.568	.985	4.482
13	LEATHER INDUSTRIES	1.175	1.719	1.298	5.152
14	TEXTILE INDUSTRIES	1.038	1.627	1.102	4.742
15	CLOTHING INDUSTRIES	1.160	1.718	1.336	4.828
16	WOOD INDUSTRIES	1.161	1.693	1.257	5.197
17	FURNITURE AND FIXTURES INDUSTRIES	1.140	1.686	1.227	4.767
18	PAPER AND ALLIED INDUSTRIES	.833	1.499	.771	3.925
19	PRINTING AND PUBLISHING	1.062	1.653	1.056	4.235
20	PRIMARY METAL INDUSTRIES	.774	1.277	.706	3.784
21	METAL FABRICATING INDUSTRIES	.956	1.544	.890	4.221
22	MACHINERY INDUSTRIES	1.078	1.611	1.029	4.669
23	TRANSPORTATION EQUIPMENT INDUSTRIES	1.114	1.657	1.136	5.007
24	ELECTRICAL PRODUCTS INDUSTRIES	1.161	1.658	1.198	5.274
25	NON-METALLIC MINERAL PRODUCTS INDUSTRIES	.915	1.542	.853	4.109
26	PETROLEUM AND COAL PRODUCTS INDUSTRIES	.625	1.466	.514	4.063
27	CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	.816	1.474	.730	4.142
28	MISC. MANUFACTURING INDUSTRIES	1.093	1.655	1.148	4.755
29	CONSTRUCTION INDUSTRY	1.104	1.614	.990	4.574
30	WHOLESALE AND RETAIL TRADE INDUSTRY	1.202	1.728	1.380	4.315
31	TRANSPORTATION AND STORAGE INDUSTRY	.967	1.552	.994	4.082
32	COMMUNICATIONS INDUSTRY	.966	1.588	1.024	3.631
33	UTILITIES	.888	1.527	.695	3.358
34	FINANCE, INSURANCE AND REAL ESTATE	.652	1.333	.475	2.866
35	HEALTH AND HOSPITAL INDUSTRY	1.471	1.916	1.006	4.709
36	BUSINESS SERVICES INDUSTRY	1.188	1.727	1.127	4.168
37	ACCOMMODATION AND FOOD SERVICES INDUSTRY	1.208	1.735	1.502	4.706
38	OTHER PERSONAL AND MISC. SERVICES INDUSTRY	1.029	1.617	1.375	4.000
39	DUMMY INDUSTRY I (1)	.977	1.487	1.016	5.022
40	DUMMY INDUSTRY II (2)	.951	1.468	1.033	4.791
41	TRANSPORTATION MARGINS (3)	.967	1.552	.994	5.080
42	HOUSEHOLDS (4)	.698	1.088	.713	3.805

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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TABLE 6 TOTAL MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES) BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOYMENT	GROSS OUTPUT
1 AGRICULTURE	1 896	1 246	882	3 041
2 FORESTRY	1 726	1 052	1 101	3 223
3 FISHING, HUNTING AND TRAPPING	1 845	1 299	934	2 613
4 COAL MINES	1 396	989	316	2 139
5 PETROLEUM AND GAS WELLS	1 324	1 010	233	2 099
6 OTHER MINES AND QUARRIES	1 578	1 075	446	2 541
7 SERVICES INCIDENTAL TO MINING	1 842	1 233	621	2 813
8 MEAT AND POULTRY PRODUCTS INDUSTRY	1 774	1 093	767	3 579
9 DAIRY FACTORIES	1 708	987	727	3 138
10 MISC. FOOD INDUSTRIES	1 627	900	637	3 096
11 BEVERAGE INDUSTRIES	1 544	869	528	2 551
12 RUBBER INDUSTRIES	1 584	842	543	2 427
13 LEATHER INDUSTRIES	1 669	986	812	3 063
14 TEXTILE INDUSTRIES	1 483	741	542	2 212
15 CLOTHING INDUSTRIES	1 546	774	676	2 158
16 WOOD INDUSTRIES	1 631	881	707	2 843
17 FURNITURE AND FIXTURES INDUSTRIES	1 605	852	682	2 382
18 PAPER AND ALLIED INDUSTRIES	1 489	944	428	2 376
19 PRINTING AND PUBLISHING	1 673	1 023	679	2 519
20 PRIMARY METAL INDUSTRIES	1 410	687	360	2 089
21 METAL FABRICATING INDUSTRIES	1 506	825	460	2 180
22 MACHINERY INDUSTRIES	1 563	794	534	2 342
23 TRANSPORTATION EQUIPMENT INDUSTRIES	1 491	689	514	2 239
24 ELECTRICAL PRODUCTS INDUSTRIES	1 519	631	574	2 349
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	1 585	1 007	531	2 634
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	1 414	1 121	310	3 121
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	1 454	857	386	2 455
28 MISC. MANUFACTURING INDUSTRIES	1 587	847	649	2 455
29 CONSTRUCTION INDUSTRY	1 681	946	570	2 689
30 WHOLESALE AND RETAIL TRADE INDUSTRY	1 902	1 259	1 079	3 005
31 TRANSPORTATION AND STORAGE INDUSTRY	1 683	1 107	710	2 835
32 COMMUNICATIONS INDUSTRY	1 718	1 203	772	2 550
33 UTILITIES	1 682	1 205	488	2 457
34 FINANCE, INSURANCE AND REAL ESTATE	1 488	1 076	310	2 147
35 HEALTH AND HOSPITAL INDUSTRY	1 121	1 375	651	3 175
36 BUSINESS SERVICES INDUSTRY	1 908	1 292	844	2 949
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	1 823	1 142	1 114	3 023
38 OTHER PERSONAL AND MISC. SERVICES INDUSTRY	1 745	1 173	1 089	2 756
39 DUMMY INDUSTRY I (1)	1 361	549	433	2 398
40 DUMMY INDUSTRY II (2)	1 551	840	631	3 086
41 TRANSPORTATION MARGINS (3)	1 616	1 000	641	3 559
42 HOUSEHOLDS (4)	1 364	572	374	2 345

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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TABLE 7. TOTAL MULTIPLIERS (RATIO FORM, WITHOUT LEAKAGES) BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOYMENT	GROSS OUTPUT
1 AGRICULTURE	2 361	2 737	2 391	4 586
2 FORESTRY	3 686	4 425	2 400	4 850
3 FISHING, HUNTING AND TRAPPING	1 887	1 949	1 791	3 712
4 COAL MINES	3 340	2 054	5 242	3 121
5 PETROLEUM AND GAS WELLS	6 405	2 276	10 306	2 733
6 OTHER MINES AND QUARRIES	2 969	2 502	4 453	3 725
7 SERVICES INCIDENTAL TO MINING	2 133	2 299	3 019	4 123
8 MEAT AND POULTRY PRODUCTS INDUSTRY	15 330	15 607	15 893	5 432
9 DAIRY FACTORIES	6 529	7 629	6 061	5 264
10 MISC. FOOD INDUSTRIES	10 492	11 358	10 025	5 414
11 BEVERAGE INDUSTRIES	4 225	3 992	4 664	4 568
12 RUBBER INDUSTRIES	3 188	3 712	3 586	4 482
13 LEATHER INDUSTRIES	4 342	5 005	3 602	5 152
14 TEXTILE INDUSTRIES	4 031	4 293	3 555	4 742
15 CLOTHING INDUSTRIES	3 480	3 902	2 946	4 828
16 WOOD INDUSTRIES	4 538	5 463	4 582	5 197
17 FURNITURE AND FIXTURES INDUSTRIES	3 292	3 744	3 003	4 767
18 PAPER AND ALLIED INDUSTRIES	3 641	2 859	5 225	3 925
19 PRINTING AND PUBLISHING	2 641	2 853	2 675	4 235
20 PRIMARY METAL INDUSTRIES	3 944	3 687	4 960	3 784
21 METAL FABRICATING INDUSTRIES	3 292	3 199	3 715	4 221
22 MACHINERY INDUSTRIES	3 471	4 048	3 763	4 469
23 TRANSPORTATION EQUIPMENT INDUSTRIES	4 493	5 281	4 412	5 007
24 ELECTRICAL PRODUCTS INDUSTRIES	4 374	7 182	3 816	5 274
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	3 252	3 115	3 732	4 109
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	10 036	8 540	17 347	4 063
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	4 502	4 106	5 884	4 142
28 MISC. MANUFACTURING INDUSTRIES	3 428	3 971	3 073	4 755
29 CONSTRUCTION INDUSTRY	3 333	4 030	4 488	4 574
30 WHOLESALE AND RETAIL TRADE INDUSTRY	2 230	2 591	1 934	4 315
31 TRANSPORTATION AND STORAGE INDUSTRY	2 981	3 016	2 883	4 082
32 COMMUNICATIONS INDUSTRY	2 268	2 138	2 210	3 631
33 UTILITIES	2 088	1 972	2 915	3 358
34 FINANCE, INSURANCE AND REAL ESTATE	2 434	1 846	3 707	2 866
35 HEALTH AND HOSPITAL INDUSTRY	1 957	2 448	3 707	4 709
36 BUSINESS SERVICES INDUSTRY	2 134	2 358	2 366	4 168
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	2 778	3 225	2 098	4 706
38 OTHER PERSONAL AND MISC. SERVICES INDUSTRY	2 390	2 440	1 801	4 090

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APPENDIX I

DATA SOURCES

Most of the data required for the calculation of multipliers are contained in 1974 Alberta Input-Output Tables. Additional data requirements and sources used are listed below.

1. Employment by industry: To calculate employment multipliers data on employment by industry are required.

   (a) Paid workers by industry: Data are obtained from Input-Output Division, Statistics Canada.

   (b) Other than paid workers by industry: Control total for this category is derived using the information contained in Statistics Canada Catalogue #'s 71-201 and 72-516. Industrial distribution is obtained using national proportions. It is noted that more than half of the total is employed in agriculture.

2. Personal Income: Data about Personal Income and Outlay components are required to close the model and to calculate household income multipliers. These data are obtained from Table 6, Alberta Economic Accounts, 1982. Household income is treated as the sum of wages, salaries and supplementary labour income, military pay and allowances, net income of unincorporated business, interest, dividends and miscellaneous investment income and current transfers to persons. The distribution of the first three components by industry is available in the 1974 input-output tables. Transfers to persons fall outside the production system, thus is not included in G.D.P. Industrial distribution of interest, dividends, and miscellaneous investment income is obtained in two steps: (a) wherever possible, the different components of this item are allocated to industries using the worksheet details available in the personal sector of Alberta Economic Accounts; and (b) the remainder of the total after the first step is allocated to industries using operating surplus as an allocator.

TABLE 8. TOTAL MULTIPLIERS (RATIO FORM, WITH LEAKAGES)
BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 AGRICULTURE	1.697	1.901	1.714	3.041
2 FORESTRY	2.438	2.850	1.788	3.223
3 FISHING, HUNTING AND TRAPPING	1.455	1.498	1.408	2.613
4 COAL MINES	2.135	1.516	3.091	2.139
5 PETROLEUM AND GAS WELLS	4.428	1.845	6.463	2.099
6 OTHER MINES AND QUARRIES	2.029	1.793	2.795	2.541
7 SERVICES INCIDENTAL TO MINING	1.576	1.669	2.041	2.813
8 MEAT AND POULTRY PRODUCTS INDUSTRY	9.798	9.680	10.145	3.579
9 DAIRY FACTORIES	3.810	4.274	3.587	3.138
10 MISC. FOOD INDUSTRIES	5.620	5.914	5.427	3.096
11 BEVERAGE INDUSTRIES	2.300	2.197	2.517	2.551
12 RUBBER INDUSTRIES	1.804	1.993	1.976	2.427
13 LEATHER INDUSTRIES	2.583	2.871	2.254	3.063
14 TEXTILE INDUSTRIES	1.875	1.954	1.748	2.212
15 CLOTHING INDUSTRIES	1.638	1.758	1.491	2.158
16 WOOD INDUSTRIES	2.467	2.843	2.579	2.843
17 FURNITURE AND FIXTURES INDUSTRIES	1.747	1.893	1.667	2.382
18 PAPER AND ALLIED INDUSTRIES	2.138	1.800	2.903	2.376
19 PRINTING AND PUBLISHING	1.686	1.765	1.721	2.519
20 PRIMARY METAL INDUSTRIES	2.089	1.984	2.533	2.089
21 METAL FABRICATING INDUSTRIES	1.745	1.710	1.920	2.180
22 MACHINERY INDUSTRIES	1.812	1.995	1.955	2.342
23 TRANSPORTATION EQUIPMENT INDUSTRIES	1.981	2.196	1.998	2.239
24 ELECTRICAL PRODUCTS INDUSTRIES	1.953	2.735	1.829	2.349
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	2.081	2.034	2.322	2.634
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	6.643	6.529	10.444	3.121
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	2.503	2.387	3.108	2.455
28 MISC. MANUFACTURING INDUSTRIES	1.843	2.032	1.738	2.455
29 CONSTRUCTION INDUSTRY	2.054	2.364	2.587	2.689
30 WHOLESALE AND RETAIL TRADE INDUSTRY	1.674	1.887	1.512	3.005
31 TRANSPORTATION AND STORAGE INDUSTRY	2.104	2.151	2.057	2.835
32 COMMUNICATIONS INDUSTRY	1.684	1.619	1.665	2.550
33 UTILITIES	1.603	1.555	2.049	2.457
34 FINANCE, INSURANCE AND REAL ESTATE	1.821	1.489	3.074	2.147
35 HEALTH AND HOSPITAL INDUSTRY	1.491	1.757	2.398	3.175
36 BUSINESS SERVICES INDUSTRY	1.631	1.764	1.772	2.949
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	1.893	2.123	1.557	3.023
38 OTHER PERSONAL AND MISC. SERVICES INDUSTRY	1.730	1.770	1.426	2.756

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TABLES

TOTAL MULTIPLIERS BY COMMODITY

TABLE 9. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY MAJOR COMMODITY, 1974

COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 LIVE ANIMALS	1.242	1.795	1.209	4.571
2 GRAINS	1.242	1.795	1.209	4.571
3 OTHER AGRICULTURAL PRODUCTS	1.239	1.792	1.206	4.574
4 FISHING AND TRAPPING PRODUCTS	1.095	1.691	1.168	3.714
5 FORESTRY PRODUCTS	1.106	1.651	1.415	4.878
6 MINERAL FUELS	.514	1.281	.405	2.855
7 NON-METALLIC MINERALS	.621	1.356	.526	3.264
8 PRODUCTS RELATING TO MINES	.515	1.281	.406	2.856
9 MEAT, FISH AND DAIRY PRODUCTS	1.041	1.649	1.009	4.800
10 FRUIT, VEG., FEED & MISC. FOOD PROD.	1.029	1.641	.989	4.825
11 BEVERAGES	1.028	1.641	.987	4.827
12 RUBBER, LEATHER, PLASTIC FAB. PROD.	1.030	1.642	.991	4.823
13 TEXTILE PRODUCTS	1.041	1.647	1.013	4.793
14 KNITTED PRODUCTS AND CLOTHING	1.029	1.641	.988	4.826
15 LUMBER, SAWMILL, OTHER WOOD PROD.	1.029	1.641	.989	4.827
16 FURNITURE AND FIXTURES	1.030	1.642	.991	4.822
17 PULP, PAPER AND PAPER PRODUCTS	1.029	1.641	.988	4.827
18 PRINTING AND PUBLISHING	1.029	1.641	.988	4.826
19 PRIMARY METAL PRODUCTS	1.028	1.641	.987	4.827
20 METAL FABRICATING PRODUCTS	1.029	1.641	.989	4.825
21 MACHINERY AND EQUIPMENT	1.004	1.624	.960	4.736
22 AUTOS, TRUCKS, OTHER TRANS. EQUIP.	1.027	1.638	.988	4.798
23 ELECTRICAL AND COMMUNICATIONS PROD.	1.003	1.622	.993	4.353
24 NON-METALLIC MINERAL PRODUCTS	1.028	1.641	.987	4.826
25 PETROLEUM AND COAL PRODUCTS	.836	1.506	.769	4.087
26 CHEMICALS AND CHEMICAL PRODUCTS	1.028	1.641	.987	4.827
27 MISC. MANUFACTURED PRODUCTS	1.060	1.657	1.055	4.726
28 CONSTRUCTION	1.089	1.628	.966	4.657
29 WHOLESALE AND RETAIL TRADE	1.192	1.727	1.342	4.352
30 TRANSPORTATION AND STORAGE	.976	1.560	.986	4.112
31 COMMUNICATION SERVICES	.962	1.591	.997	3.644
32 OTHER UTILITIES	.883	1.528	.677	3.371
33 REAL ESTATE RENT	.660	1.343	.479	2.916
34 FINANCE, INSURANCE AND REAL ESTATE	.648	1.335	.461	2.881
35 BUSINESS, PERSONAL & OTHER MISC. SVCS	1.149	1.703	1.263	4.308
36 DUMMY COMMODITY I (1)	.982	1.513	1.006	5.205
37 DUMMY COMMODITY II (2)	.943	1.467	.978	4.885
38 TRANSPORTATION MARGINS (3)	.976	1.560	.986	5.112
39 HOUSEHOLD SERVICES (4)	.680	1.082	.669	3.776

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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TABLE 10. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES) BY MAJOR COMMODITY, 1974

COMMODITY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 LIVE ANIMALS	.787	1.089	.770	2.617
2 GRAINS	.670	.927	.655	2.226
3 OTHER AGRICULTURAL PRODUCTS	.673	.932	.658	2.246
4 FISHING AND TRAPPING PRODUCTS	.415	.635	.455	1.272
5 FORESTRY PRODUCTS	.641	.922	.917	2.780
6 MINERAL FUELS	.357	1.020	.259	2.141
7 NON-METALLIC MINERALS	.127	.314	.101	.715
8 PRODUCTS RELATING TO MINES	.358	1.021	.259	2.144
9 MEAT, FISH AND DAIRY PRODUCTS	.492	.776	.478	2.298
10 FRUIT, VEG., FEED & MISC FOOD PROD.	.264	.421	.253	1.269
11 BEVERAGES	.317	.507	.303	1.528
12 RUBBER, LEATHER, PLASTIC FAB. PROD.	.097	.154	.093	.465
13 TEXTILE PRODUCTS	.032	.050	.031	.148
14 KNITTED PRODUCTS AND CLOTHING	.039	.062	.037	.187
15 LUMBER, SAWMILL, OTHER WOOD PROD.	.262	.418	.251	1.262
16 FURNITURE AND FIXTURES	.196	.312	.188	.939
17 PULP, PAPER AND PAPER PRODUCTS	.118	.188	.113	.568
18 PRINTING AND PUBLISHING	.304	.486	.291	1.465
19 PRIMARY METAL PRODUCTS	.104	.166	.099	.500
20 METAL FABRICATING PRODUCTS	.179	.286	.172	.862
21 MACHINERY AND EQUIPMENT	.065	.106	.061	.314
22 AUTOS, TRUCKS, OTHER TRANS. EQUIP.	.085	.135	.081	.404
23 ELECTRICAL AND COMMUNICATIONS PROD.	.070	.114	.070	.297
24 NON-METALLIC MINERAL PRODUCTS	.347	.555	.332	1.673
25 PETROLEUM AND COAL PRODUCTS	.482	.932	.431	2.474
26 CHEMICALS AND CHEMICAL PRODUCTS	.168	.269	.161	.811
27 MISC. MANUFACTURED PRODUCTS	.112	.173	.114	.494
28 CONSTRUCTION	.652	.928	.545	2.654
29 WHOLESALE AND RETAIL TRADE	.893	1.249	1.054	2.993
30 TRANSPORTATION AND STORAGE	.624	.996	.642	2.542
31 COMMUNICATION SERVICES	.722	1.206	.764	2.557
32 OTHER UTILITIES	.602	1.064	.429	2.175
33 REAL ESTATE RENT	.483	1.053	.313	2.115
34 FINANCE, INSURANCE AND REAL ESTATE	.433	.957	.273	1.911
35 BUSINESS, PERSONAL & OTHER MISC. SVCS	.796	1.146	.913	2.751
36 DUMMY COMMODITY I (1)	.383	.557	.429	2.445
37 DUMMY COMMODITY II (2)	.541	.826	.586	3.062
38 TRANSPORTATION MARGINS (3)	.624	.996	.642	3.542
39 HOUSEHOLD SERVICES (4)	.367	.581	.366	2.349

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE 11. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES) BY DETAILED COMMODITY, 1974

	COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	LIVE ANIMALS	1.246	1.793	1.230	4.586
2	GRAINS	1.246	1.793	1.230	4.586
3	OTHER AGRICULTURAL PRODUCTS	1.244	1.792	1.230	4.598
4	FISHING AND TRAPPING PRODUCTS	1.096	1.690	1.188	3.712
5	FORESTRY PRODUCTS	1.109	1.645	1.448	4.859
6	COAL	.619	1.340	.536	3.121
7	CRUDE MINERAL OILS	.468	1.246	.372	2.733
8	NATURAL GAS	.468	1.246	.372	2.733
9	NON-METALLIC MINERALS	.540	1.294	.439	2.929
10	SERVICES INCIDENTAL TO MINING	1.139	1.699	.918	4.122
11	MEAT PRODUCTS	1.212	1.761	1.211	5.352
12	DAIRY PRODUCTS	1.213	1.762	1.228	5.264
13	FISH PRODUCTS	1.160	1.716	1.200	5.087
14	FRUITS & VEGETABLES PREPARATIONS	1.160	1.720	1.166	5.349
15	FEEDS	1.170	1.728	1.178	5.403
16	FLOUR MILL PRODUCTS	1.170	1.728	1.176	5.414
17	BREAKFAST CEREAL & BAKERY PROD.	1.169	1.727	1.176	5.400
18	SUGAR & MOLASSES	1.170	1.728	1.176	5.414
19	MISC. FOOD PRODUCTS	1.170	1.728	1.177	5.407
20	BEVERAGES	.999	1.580	.978	4.569
21	TIRES & TUBES	1.032	1.568	.985	4.482
22	OTHER RUBBER PRODUCTS	1.005	1.560	.957	4.433
23	PLASTIC FABRICATED PRODUCTS	1.015	1.603	1.027	4.572
24	LEATHER & LEATHER PRODUCTS	1.174	1.716	1.297	5.069
25	TEXTILE PRODUCTS	1.050	1.634	1.121	4.709
26	KNITTED PRODUCTS & CLOTHING	1.158	1.716	1.330	4.825
27	LUMBER & TIMBER	1.159	1.692	1.259	5.186
28	VENEER & PLYWOOD	1.161	1.693	1.257	5.197
29	OTHER WOOD PRODUCTS	1.157	1.691	1.250	5.179
30	FURNITURE & FIXTURES	1.133	1.680	1.216	4.777
31	PULP	.833	1.499	.771	3.925
32	PAPER & PAPER PRODUCTS	.843	1.506	.785	3.947
33	PRINTING & PUBLISHING	1.062	1.653	1.056	4.235
34	IRON & STEEL PRODUCTS	.789	1.299	.721	3.821
35	NON FERROUS METAL PROD.	.781	1.286	.712	3.801
36	BOILERS, TANKS & PLATES	.958	1.546	.893	4.231
37	FABRICATED STRUCTURAL METAL PROD.	.945	1.528	.881	4.198
38	OTHER METAL FABRICATED PROD.	.969	1.549	.912	4.273

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE 11 TOTAL MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES) BY DETAILED COMMODITY, 1974 CONTINUED

COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
39 AGRICULTURAL MACHINERY	1.080	1.614	1.038	4.698
40 OTHER INDUSTRIAL MACHINERY	1.061	1.603	1.003	4.579
41 MOTOR VEHICLES	1.115	1.658	1.141	5.012
42 MOTOR VEHICLE PARTS	.999	1.577	.964	4.443
43 OTHER TRANSPORTATION EQUIPMENT	1.074	1.628	1.099	4.736
44 APPLIANCES & RECEIVERS,HOUSEHOLD	1.015	1.592	1.000	4.500
45 OTHER ELEC. PRODUCTS	1.079	1.628	1.123	4.587
46 CEMENT & CONCRETE PRODUCTS	.915	1.542	.853	4.109
47 OTHER NON-METALLIC MINERAL PROD	.916	1.542	.855	4.110
48 GASOLINE	.625	1.466	.514	4.063
49 FUEL OIL	.625	1.466	.514	4.063
50 LUBRICATING OIL & GREASE	.625	1.466	.514	4.063
51 OTHER PETROLEUM & COAL PROD	.491	1.275	.394	2.906
52 FERTILIZERS	.816	1.471	.730	4.142
53 PHARMACEUTICALS	1.195	1.749	1.188	5.392
54 INORGANIC CHEMICALS	.799	1.395	.720	3.999
55 ORGANIC CHEMICALS	.821	1.477	.736	4.158
56 INDUSTRIAL CHEMICAL PROD.	.804	1.445	.720	4.086
57 OTHER CHEMICAL PROD	.926	1.552	.868	4.534
58 SCIENCE & LABORATORY EQUIP	1.086	1.650	1.137	4.740
59 MISC MANUFACTURED PRODUCTS	1.033	1.620	1.126	4.417
60 CONSTRUCTION	1.104	1.614	.990	4.574
61 WHOLESALE & RETAIL TRADE	1.193	1.721	1.368	4.319
62 TRANSPORTATION & STORAGE	.967	1.552	.994	4.080
63 RADIO & TELEVISION BROADCASTING	.966	1.588	1.024	3.631
64 TELEPHONE & TELEGRAPH	.966	1.588	1.024	3.631
65 POSTAL SERVICES	.966	1.588	1.024	3.631
66 ELECTRIC POWER	.888	1.527	.695	3.359
67 OTHER UTILITIES	.876	1.525	.696	3.405
68 REAL ESTATE RENT	.663	1.342	.493	2.902
69 FINANCE, INSURANCE & REAL ESTATE	.654	1.335	.477	2.872
70 HEALTH & HOSPITAL SERVICES	1.471	1.916	1.006	4.709
71 BUSINESS SERVICES	1.150	1.701	1.173	4.123
72 ACCOMMODATION & MEALS	1.205	1.733	1.493	4.685
73 OTHER PERSONAL & MISC SERVICES	1.015	1.605	1.306	3.955
74 DUMMY COMMODITY I (1)	.977	1.487	1.016	5.022
75 DUMMY COMMODITY II (2)	.951	1.468	1.033	4.791
76 TRANSPORTATION MARGINS (3)	.967	1.552	.994	5.080
77 HOUSEHOLD SERVICES (4)	.698	1.088	.713	3.805

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE 12. TOTAL MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES) BY DETAILED COMMODITY, 1974

COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 LIVE ANIMALS	797	1.108	.784	2.706
2 GRAINS	.678	.943	.667	2.302
3 OTHER AGRICULTURAL PRODUCTS	.681	.948	.671	2.325
4 FISHING AND TRAPPING PRODUCTS	.412	.633	.455	1.273
5 FORESTRY PRODUCTS	.636	.918	.928	2.786
6 COAL	.382	.955	.305	2.064
7 CRUDE MINERAL OILS	.323	1.009	.233	2.098
8 NATURAL GAS	.324	1.010	.233	2.098
9 NON-METALLIC MINERALS	.242	.666	.180	1.428
10 SERVICES INCIDENTAL TO MINING	.841	1.233	.621	2.813
11 MEAT PRODUCTS	.657	.927	.659	2.964
12 DAIRY PRODUCTS	.570	.794	.585	2.525
13 FISH PRODUCTS	.005	.007	.005	.022
14 FRUITS & VEGETABLES PREPARATIONS	.073	.106	.074	.359
15 FEEDS	.585	.840	.596	2.880
16 FLOUR MILL PRODUCTS	.240	.345	.244	1.188
17 BREAKFAST CEREAL & BAKERY PROD.	.281	.404	.286	1.383
18 SUGAR & MOLASSES	.314	.451	.319	1.551
19 MISC. FOOD PRODUCTS	.124	.179	.127	.612
20 BEVERAGES	.294	.470	.285	1.379
21 TIRES & TUBES	.069	.099	.064	.285
22 OTHER RUBBER PRODUCTS	.006	.009	.005	.025
23 PLASTIC FABRICATED PRODUCTS	.206	.318	.213	.916
24 LEATHER & LEATHER PRODUCTS	.038	.054	.045	.164
25 TEXTILE PRODUCTS	.028	.042	.032	.124
26 KNITTED PRODUCTS & CLOTHING	.035	.050	.044	.140
27 LUMBER & TIMBER	.253	.354	.285	1.137
28 VENEER & PLYWOOD	.094	.131	.106	.424
29 OTHER WOOD PRODUCTS	.400	.559	.447	1.799
30 FURNITURE & FIXTURES	.200	.284	.225	.802
31 PULP	.033	.063	.028	.158
32 PAPER & PAPER PRODUCTS	.102	.195	.091	.492
33 PRINTING & PUBLISHING	.351	.530	.352	1.306
34 IRON & STEEL PRODUCTS	.075	.126	.067	.379
35 NON FERROUS METAL PROD.	.065	.109	.057	.330
36 BOILERS, TANKS & PLATES	.276	.449	.251	1.189
37 FABRICATED STRUCTURAL METAL PROD.	.242	.395	.220	1.053
38 OTHER METAL FABRICATED PROD.	.110	.176	.102	.473

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TABLE 12 TOTAL MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES) BY DETAILED COMMODITY, 1974 -CONTINUED

COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
39 AGRICULTURAL MACHINERY	.014	.020	.013	.059
40 OTHER INDUSTRIAL MACHINERY	.089	.129	.083	.369
41 MOTOR VEHICLES	.080	.112	.084	.363
42 MOTOR VEHICLE PARTS	.039	.061	.037	.169
43 OTHER TRANSPORTATION EQUIPMENT	.075	.110	.078	.328
44 APPLIANCES & RECEIVERS,HOUSEHOLD	.002	.003	.002	.007
45 OTHER ELEC. PRODUCTS	.095	.137	.103	.384
46 CEMENT & CONCRETE PRODUCTS	.496	.853	.450	2.233
47 OTHER NON-METALLIC MINERAL PROD	.146	.251	.133	.657
48 GASOLINE	.409	1.108	.306	3.084
49 FUEL OIL	.399	1.081	.299	3.010
50 LUBRICATING OIL & GREASE	.340	.921	.254	2.564
51 OTHER PETROLEUM & COAL PROD	.311	.945	.227	2.057
52 FERTILIZERS	.003	.006	.003	.016
53 PHARMACEUTICALS	.009	.013	.009	.042
54 INORGANIC CHEMICALS	.352	.636	.303	1.863
55 ORGANIC CHEMICALS	.091	.171	.078	.493
56 INDUSTRIAL CHEMICAL PROD	.155	.292	.132	.840
57 OTHER CHEMICAL PROD	.145	.249	.133	.759
58 SCIENCE & LABORATORY EQUIP	.122	.177	.134	.514
59 MISC MANUFACTURED PRODUCTS	.100	.155	.115	.412
60 CONSTRUCTION	.681	.946	.570	2.689
61 WHOLESALE & RETAIL TRADE	.888	1.244	1.062	2.983
62 TRANSPORTATION & STORAGE	.616	1.000	.641	2.559
63 RADIO & TELEVISION BROADCASTING	.717	1.202	.771	2.548
64 TELEPHONE & TELEGRAPH	.718	1.203	.772	2.550
65 POSTAL SERVICES	.718	1.203	.772	2.550
66 ELECTRIC POWER	.680	1.201	.487	2.150
67 OTHER UTILITIES	.409	.734	.299	1.529
68 REAL ESTATE RENT	.483	1.053	.317	2.116
69 FINANCE, INSURANCE & REAL ESTATE	.435	.957	.278	1.912
70 HEALTH & HOSPITAL SERVICES	.956	1.174	.555	2.710
71 BUSINESS SERVICES	.834	1.213	.853	2.782
72 ACCOMMODATION & MEALS	.819	1.140	1.104	3.002
73 OTHER PERSONAL & MISC. SERVICES	.680	1.080	.948	2.525
74 DUMMY COMMODITY I (1)	.381	.549	.433	2.398
75 DUMMY COMMODITY II (2)	.551	.840	.631	3.096
76 TRANSPORTATION MARGINS (3)	.616	1.000	.641	3.559
77 HOUSEHOLD SERVICES (4)	.364	.572	.374	2.345

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

FOOTNOTES

(1) The dummy industry and commodity technique is used in input-output tables to deal with "catch-all" categories of inputs reported by establishments. For example, dummy industry I contains office supplies. Instead of finding the commodity content (paper, pencils, paper clips, etc.) of office supplies for each industry, it is estimated for one industry called "office supplies" whose output is equal to the total purchases of office supplies by all industries. Also included in dummy industry I are four other similar inputs - operating supplies, cafeteria requirements, labratory supplies and machinery repair services.

Corresponding to each dummy industry, there is one dummy commodity. Thus, office supplies, operating supplies, cafeteria requirements, laboratory supplies and machinery repair services are included in dummy commodity I in all commodity tables.

(2) Dummy industry II includes two additional dummy industries - travel and entertainment, and advertising and promotion. Corresponding dummy commodities are included in dummy commodity II in commodity tables.

(3) The transportation margins dummy industry and commodity technique is used in input-output tables to deal with the transportation cost associated with the movement of commodities from point of production to purchasers. All such transportation costs are called transportation margins which are paid by purchasers. It is difficult to identify these transportation costs by type of transport (e.g., air transport, rail transport, truck transport etc.) for each commodity and for each industry. Therefore, all these transportation margins are routed through a dummy industry called "transportation margins". This dummy industry purchases all types of transport from the transportation industry and produces the dummy commodity - "transportation margin" which is allocated by commodity for each industry and final demand category.

(4) "Households" is an industry when the model is closed with respect to households to examine the feedback effects of spending the additional income generated in the production process. "Households" consist of persons, unincorporated businesses and non-profit organizations. The inputs of this industry are the commodities in the personal expenditure column. The output of this industry is "household services" which appears in commodity tables. "Household services" consist of labour and capital services provided by households.

APPENDICES

APPENDIX II

METHODOLOGY

The input-output model, when used to study the effects on the economy of a change in the final demand, becomes an impact, or multiplier model. Details about deriving impact tables from input-output tables and the mathematical description of the open input-output model were provided in an earlier Bureau publication on 1974 Alberta input-output tables. This appendix presents, in non-technical terms, the methodology employed to calculate the four types of multipliers included in this report.

In simple terms, the methodology employed to derive multipliers consists of two steps: (a) deriving a total requirements table for a dollar increase in final demand, or a dollar increase in production and (b) applying direct factor coefficients to the total requirements table to obtain multipliers. The total requirements table is the basis for calculation of all multipliers. This table presents the direct and indirect effects on industry outputs of a dollar increase in final demand or a dollar increase in production. For example, suppose there is a one dollar increase in the production of the agricultural industry. This creates demand for all industry outputs the agriculture industry is purchasing to produce the additional dollar of output. This, in turn, necessitates an increase in the production of all those industries supplying inputs to the agriculture industry. They, in turn, increase the demand for outputs of their suppliers. This process continues until the economy reaches an equilibrium position, i.e., where supply equals demand. In this equilibrium position, the level of the agriculture industry's output is determined by the direct and indirect effects of a dollar increase in the final sales of the agriculture industry's output. All these effects can be expressed using the technology matrix B, which provides the direct requirements to produce one dollar of output of each industry. The matrix (I-B) is called the Leontief matrix, where I is an identity matrix with appropriate dimensions. The inverse of (I-B) provides the total requirements table in a simple case of an industry by industry input-output table. Each column in the inverse of (I-B) provides the direct

and indirect requirements of industry outputs from one dollar increase in the final sales of the output of the industry corresponding to that column. The column sum gives the "output multiplier" for the industry corresponding to that column. From this output base, we can move to any other category by multiplying the direct coefficients for that category with the direct and indirect effects on industry outputs. For example, employment multipliers are calculated by multiplying the employee/output coefficients of industries with the entries in each column of the total requirements table. This basic procedure is repeated to calculate other types of multipliers. Specifically, all multiplier results presented in this report are expressed in terms of the following:

(a) Household Income: This is the sum of wages, salaries and supplementary labour income; military pay and allowances; net income of unincorporated business; interest, dividends and miscellaneous investment income; and transfer payments to persons.
(b) G.D.P. at factor cost: This is the sum of wages, salaries and supplementary labour income; military pay and allowances; net income of unincorporated business and operating surplus, which includes profits, investment income, capital consumption allowances and inventory valuation adjustment.
(c) Employment: This is the number of paid and non-paid workers (self employed etc.).
(d) Gross Output: This equals shipments adjusted for inventory change.

For items (a), (b) and (d) above, the direct coefficients are calculated by dividing each category with the industry's total output. Employment is expressed as the number of workers per $10,000 (constant 1974 dollars) of total output. This point should be remembered when interpreting the employment multipliers given in the tables.

The multiplier tables presented in this report have been derived using the open input-output model and the closed input-output model, with and without leakages from domestic production. The distinctions between open and closed models and the method of closing the model with respect to households are explained on the next page.

Open Input-Output Model:

In this model, all the categories of final demand are treated outside the production system. Any autonomous increase in final demand is directed to the production system and the resulting equilibrium levels of outputs are calculated. In this model, the analysis of the level of income is incomplete, that is, the analysis stops at the point where demand and supply are satisfied. But, in fact, the productive activity by industries generates income which, in turn, stimulates additional final expenditure. This is not captured in the open model. Given a change in final demand, the open model is capable of evaluating only the direct and indirect effects on output requirements. Only part of the overall impact of a given change in final demand can be evaluated from an open model. Therefore, the multipliers derived using an open input-output model are treated as lower limits of actual multipliers and are designated as "Simple Multipliers".

Closed Input-Output Model:

In this model, one or more of the categories of final demand are included in the production system. The closed model takes into account both the impact of demand on supply and of supply on demand. This means that the equilibrium output levels calculated from a closed model incorporate not only the outputs required to meet a given final demand, but also the outputs required to meet the change in final demand which is induced by changes in production and income. In other words, the closed model is capable of evaluating the direct, indirect and induced effects on output requirements of a change in final demand. The multipliers based on the closed model are closer to actual multipliers and are identified by the term "Total Multipliers".

As stated above, an input-output model may be closed with respect to one or more of the final demand categories. In this report, the model is closed with respect to households only. This is accomplished by adding another industry (households) column and another commodity (household services) row

to the "Use" matrix. The inputs of the household industry consist of goods and services in the personal expenditure column in the final demand matrix. The level of household industry activity is given by total personal income. Households produce labour and capital services which are purchased by other industries and governments. The household services row consists of household incomes received from each industry. Similarly, the "Production" matrix is augmented by adding a "household services" commodity column and a "households" industry row. No other industry in the "Production" matrix produces household services and "households" industry produces no other commodity except household services. These augmented "Use" and "Production" matrices are employed in deriving the multipliers based on closed models.

Leakages from domestic production:

There are three types of leakages from domestic production: government production, inventory withdrawals and imports. The first two types of leakages are either non-existent or insignificant for most of the commodities. Government production exists in water works, health and education, whereas inventory withdrawals occur significantly in grain and other agricultural commodities in the 1974 input-output tables. Imports are the main cause of leakages from domestic production in most cases. Multiplier results are calculated employing open and closed models with and without leakages. This is done to indicate the magnitude of the effect that is lost through leakages.

Absolute Multipliers vs Ratio (Traditional) Multipliers

Multipliers presented in this report are expressed either as absolute multipliers or as ratio (traditional type) multipliers. Absolute multipliers measure the direct and indirect effect in the case of the open model, and the direct, indirect and induced effect in the case of the closed model, for a given change in final demand. In this case, there is a direct relation between the cause and the effect. Multipliers are presented in absolute form in both commodity and industry dimensions. Tables 1, 2, 5 and 6 present

total multipliers in absolute form for major and detailed industries whereas tables 9, 10, 11 and 12 present total multlipliers in absolute form for major and detailed commodities.

In regional input-output literature, multipliers are also expressed in ratio form by dividing the absolute multiplier with the direct coefficient of the primary factor for which the multiplier is being calculated. These multipliers should be interpreted as the direct, indirect and induced effect (in the case of closed model) per unit increase in the primary factor of an industry. This type of presentation is meaningful only in the industry dimension. Tables 3 and 4 provide total multipliers in ratio form for major industries whereas tables 7 and 8 provide total multipliers in ratio form for detailed industries. Tables with corresponding numbers with prefix "A" in Appendix IV provide similar breakdowns for simple multipliers.

APPENDIX III

MATHEMATICAL DESCRIPTION OF TABLES

A detailed mathematical description of an open input-output model is provided in The Input-Output Structure of the Alberta Economy, 1974. This appendix contains the notation used and the mathematical expressions employed to derive the multiplier tables included in this report.

Notation:

NI: Number of industries

NC: Number of competitive commodities

B : NC by NI technology matrix derived from the "Use" matrix

B_1: Augmented matrix of B by adding "Household Services" commodity row and "Households" industry column.

D : NI by NC market share matrix derived from "Production" matrix

D_1: Augmented matrix of D by adding "Households" industry row and "Household Services" commodity column.

R : Diagonal matrix whose diagonal elements consist of domestic content coefficients for NC commodities.

R_1: Augmented matrix of R by adding the domestic content coefficient for "Household Services".

h : A row vector of direct coefficients of a primary factor for which multiplier is calculated.

H : Diagonal matrix whose diagonal elements consist of the components of vector h.

L : Diagonal matrix whose diagonal elements consist of domestic content coefficients for NI industries outputs.

L_1: Augmented matrix of L by adding the domestic content coefficient for "Households" industry output.

I : An identity matrix with appropriate dimensions.

MATHEMATICAL EXPRESSIONS:

The mathemcatical expressions employed to derive tables included in this report are given below:

Tables 1 and 5	$h\,[I - D_1B_1]^{-1}$
Tables 2 and 6	$h\,[I - D_1R_1B_1]^{-1}$
Tables 3 and 7	$h\,[I - D_1B_1]^{-1}\,(H)^{-1}$
Tables 4 and 8	$h\,[I - D_1R_1B_1]^{-1}\,(H)^{-1}$
Tables 9 and 11	$h\,[I - D_1B_1]^{-1}\,D_1$
Tables 10 and 12	$h\,[I - D_1R_1B_1]^{-1}\,D_1R_1$
Tables A1 and A5	$h\,[I - DB]^{-1}$
Tables A2 and A6	$h\,[I - DRB]^{-1}$
Tables A3 and A7	$h\,[I - DB]^{-1}\,(H)^{-1}$
Tables A4 and A8	$h\,[I - DRB]^{-1}\,(H)^{-1}$
Tables A9 and A11	$h[I-DB]^{-1}D$
Tables A10 and A12	$h\,[I - DRB]^{-1}\,DR$

TABLE A1. SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	.739	.995	.714	1.779
2	FORESTRY	.658	.933	1.023	2.419
3	FISHING, HUNTING AND TRAPPING	.652	.986	.733	1.254
4	MINES, QUARRIES AND OIL WELLS	.306	.950	.201	1.699
5	MANUFACTURING	.612	.979	.578	2.516
6	CONSTRUCTION	.648	.926	.533	2.210
7	WHOLESALE AND RETAIL TRADE	.714	.958	.879	1.644
8	TRANSPORTATION AND STORAGE	.581	.932	.598	1.919
9	COMMUNICATIONS	.573	.972	.614	1.482
10	UTILITIES	.523	.959	.321	1.372
11	FINANCE, INSURANCE AND REAL ESTATE	.385	.917	.202	1.422
12	COMM., BUS. AND PERSONAL SERVICES	.692	.964	.821	1.731
13	DUMMY INDUSTRY I (1)	.584	.881	.615	2.999
14	DUMMY INDUSTRY II (2)	.561	.859	.603	2.765
15	TRANSPORTATION MARGINS (3)	.581	.932	.598	2.918

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A2. SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	.647	.848	.628	1.420
2	FORESTRY	.538	.741	.902	1.957
3	FISHING, HUNTING AND TRAPPING	.623	.941	.706	1.146
4	MINES, QUARRIES AND OIL WELLS	.262	.869	.163	1.529
5	MANUFACTURING	.429	.688	.404	1.821
6	CONSTRUCTION	.477	.651	.371	1.533
7	WHOLESALE AND RETAIL TRADE	.662	.875	.830	1.446
8	TRANSPORTATION AND STORAGE	.505	.810	.526	1.628
9	COMMUNICATIONS	.528	.900	.571	1.317
10	UTILITIES	.502	.924	.302	1.292
11	FINANCE, INSURANCE AND REAL ESTATE	.356	.869	.175	1.310
12	COMM., BUS. AND PERSONAL SERVICES	.623	.854	.755	1.465
13	DUMMY INDUSTRY I (1)	.280	.394	.326	1.787
14	DUMMY INDUSTRY II (2)	.396	.596	.441	2.132
15	TRANSPORTATION MARGINS (3)	.456	.731	.475	2.470

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A3 SIMPLE MULTIPLIERS (RATIO FORM, WITHOUT LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	1 401	1 518	1 389	1 779
2	FORESTRY	2 209	2 527	1 661	2 419
3	FISHING, HUNTING AND TRAPPING	1 122	1 137	1 104	1 254
4	MINES, QUARRIES AND OIL WELLS	2 624	1 676	3 266	1 699
5	MANUFACTURING	3 412	3 462	3 535	2 516
6	CONSTRUCTION	1 956	2 313	2 418	2 210
7	WHOLESALE AND RETAIL TRADE	1 324	1 437	1 232	1 644
8	TRANSPORTATION AND STORAGE	1 791	1 810	1 734	1 919
9	COMMUNICATIONS	1 344	1 308	1 326	1 482
10	UTILITIES	1 231	1 239	1 348	1 372
11	FINANCE, INSURANCE AND REAL ESTATE	1 438	1 270	2 001	1 422
12	COMM., BUS. AND PERSONAL SERVICES	1 390	1 480	1 306	1 731

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A4. SIMPLE MULTIPLIERS (RATIO FORM, WITH LEAKAGES)
BY MAJOR INDUSTRY, 1974

	INDUSTRY	HOUSEHOLD INCOME	G D P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	AGRICULTURE	1 227	1 294	1 220	1 420
2	FORESTRY	1 808	2 008	1 465	1 957
3	FISHING, HUNTING AND TRAPPING	1 074	1 085	1 064	1 146
4	MINES, QUARRIES AND OIL WELLS	2 243	1 535	2 656	1 529
5	MANUFACTURING	2 390	2 434	2 471	1 821
6	CONSTRUCTION	1 440	1 626	1 681	1 533
7	WHOLESALE AND RETAIL TRADE	1 228	1 312	1 164	1 446
8	TRANSPORTATION AND STORAGE	1 558	1 573	1 525	1 628
9	COMMUNICATIONS	1 239	1 211	1 232	1 317
10	UTILITIES	1 181	1 193	1 267	1 292
11	FINANCE, INSURANCE AND REAL ESTATE	1 330	1 203	1 737	1 310
12	COMM., BUS. AND PERSONAL SERVICES	1 251	1 311	1 201	1 465

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A5 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 AGRICULTURE	731	995	707	1 794
2 FORESTRY	646	931	1 017	2 391
3 FISHING, HUNTING AND TRAPPING	615	988	727	1 256
4 COAL MINES	365	943	276	1 734
5 PETROLEUM AND GAS WELLS	276	946	175	1 684
6 OTHER MINES AND QUARRIES	499	958	355	1 828
7 SERVICES INCIDENTAL TO MINING	671	969	440	1 569
8 MEAT AND POULTRY PRODUCTS INDUSTRY	714	986	693	2 717
9 DAIRY FACTORIES	715	984	718	2 545
10 MISC. FOOD INDUSTRIES	689	979	685	2 792
11 BEVERAGE INDUSTRIES	588	940	558	2 330
12 RUBBER INDUSTRIES	608	907	552	2 170
13 LEATHER INDUSTRIES	692	966	804	2 518
14 TEXTILE INDUSTRIES	612	962	665	2 415
15 CLOTHING INDUSTRIES	683	975	818	2 227
16 WOOD INDUSTRIES	684	950	769	2 597
17 FURNITURE AND FIXTURES INDUSTRIES	671	956	748	2 313
18 PAPER AND ALLIED INDUSTRIES	491	966	421	2 059
19 PRINTING AND PUBLISHING	626	973	609	1 355
20 PRIMARY METAL INDUSTRIES	456	781	380	2 050
21 METAL FABRICATING INDUSTRIES	563	932	489	2 080
22 MACHINERY INDUSTRIES	635	920	576	2 254
23 TRANSPORTATION EQUIPMENT INDUSTRIES	656	943	668	2 511
24 ELECTRICAL PRODUCTS INDUSTRIES	681	914	710	2 671
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	539	956	469	2 059
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	368	1 066	251	2 661
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	481	951	387	2 313
28 MISC. MANUFACTURING INDUSTRIES	644	955	689	2 306
29 CONSTRUCTION INDUSTRY	651	906	526	2 099
30 WHOLESALE AND RETAIL TRADE INDUSTRY	708	958	874	1 621
31 TRANSPORTATION AND STORAGE INDUSTRY	569	933	588	1 915
32 COMMUNICATIONS INDUSTRY	569	969	618	1 466
33 UTILITIES	523	958	322	1 368
34 FINANCE, INSURANCE AND REAL ESTATE	384	915	201	1 404
35 HEALTH AND HOSPITAL INDUSTRY	866	974	388	1 413
36 BUSINESS SERVICES INDUSTRY	700	966	628	1 506
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	711	962	994	2 000
38 OTHER PERSONAL AND MISC. SERVICES INDUSTRY	606	958	943	1 693
39 DUMMY INDUSTRY I (1)	576	861	606	2 832
40 DUMMY INDUSTRY II (2)	560	858	634	2 660
41 TRANSPORTATION MARGINS (3)	570	933	588	2 914

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A6 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES) BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 AGRICULTURE	657	870	636	1 501
2 FORESTRY	532	748	901	1 974
3 FISHING, HUNTING AND TRAPPING	619	945	702	1 160
4 COAL MINES	290	823	208	1 458
5 PETROLEUM AND GAS WELLS	237	874	145	1 542
6 OTHER MINES AND QUARRIES	424	833	288	1 546
7 SERVICES INCIDENTAL TO MINING	617	880	390	1 365
8 MEAT AND POULTRY PRODUCTS INDUSTRY	568	768	555	2 247
9 DAIRY FACTORIES	519	690	532	1 920
10 MISC FOOD INDUSTRIES	459	637	465	2 018
11 BEVERAGE INDUSTRIES	399	641	378	1 615
12 RUBBER INDUSTRIES	428	597	383	1 423
13 LEATHER INDUSTRIES	513	692	620	1 860
14 TEXTILE INDUSTRIES	354	538	409	1 382
15 CLOTHING INDUSTRIES	400	545	526	1 219
16 WOOD INDUSTRIES	463	617	534	1 758
17 FURNITURE AND FIXTURES INDUSTRIES	443	599	516	1 342
18 PAPER AND ALLIED INDUSTRIES	359	739	294	1 535
19 PRINTING AND PUBLISHING	497	738	493	1 354
20 PRIMARY METAL INDUSTRIES	301	515	248	1 384
21 METAL FABRICATING INDUSTRIES	371	613	321	1 309
22 MACHINERY INDUSTRIES	412	558	380	1 374
23 TRANSPORTATION EQUIPMENT INDUSTRIES	360	483	379	1 395
24 ELECTRICAL PRODUCTS INDUSTRIES	380	414	432	1 458
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	429	761	370	1 628
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	304	947	196	2 409
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	333	666	261	1 675
28 MISC MANUFACTURING INDUSTRIES	431	600	488	1 445
29 CONSTRUCTION INDUSTRY	499	661	383	1 518
30 WHOLESALE AND RETAIL TRADE INDUSTRY	662	880	831	1 453
31 TRANSPORTATION AND STORAGE INDUSTRY	501	821	522	1 661
32 COMMUNICATIONS INDUSTRY	526	902	575	1 316
33 UTILITIES	500	919	301	1 285
34 FINANCE, INSURANCE AND REAL ESTATE	358	871	176	1 308
35 HEALTH AND HOSPITAL INDUSTRY	822	905	343	1 248
36 BUSINESS SERVICES INDUSTRY	666	911	595	1 387
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	603	797	889	1 608
38 OTHER PERSONAL AND MISC SERVICES INDUSTRY	546	860	885	1 475
39 DUMMY INDUSTRY I (1)	279	389	328	1 743
40 DUMMY INDUSTRY II (2)	404	609	480	2 138
41 TRANSPORTATION MARGINS (3)	452	741	471	2 499

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1981

TABLE A7 SIMPLE MULTIPLIERS (RATIO FORM, WITHOUT LEAKAGES)
BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 AGRICULTURE	1 391	1 519	1 374	1 794
2 FORESTRY	2 171	2 521	1 651	2 391
3 FISHING, HUNTING AND TRAPPING	1 111	1 139	1 097	1 256
4 COAL MINES	1 967	1 446	2 699	1 734
5 PETROLEUM AND GAS WELLS	3 773	1 728	4 857	1 684
6 OTHER MINES AND QUARRIES	1 749	1 598	2 226	1 828
7 SERVICES INCIDENTAL TO MINING	1 257	1 311	1 445	1 569
8 MEAT AND POULTRY PRODUCTS INDUSTRY	9 030	8 734	9 162	2 717
9 DAIRY FACTORIES	3 846	4 262	3 543	2 545
10 MISC. FOOD INDUSTRIES	6 180	6 433	5 835	2 792
11 BEVERAGE INDUSTRIES	2 489	2 375	2 661	2 330
12 RUBBER INDUSTRIES	1 878	2 147	2 009	2 170
13 LEATHER INDUSTRIES	2 558	2 812	2 231	2 518
14 TEXTILE INDUSTRIES	2 375	2 538	2 147	2 415
15 CLOTHING INDUSTRIES	2 050	2 214	1 870	2 227
16 WOOD INDUSTRIES	2 673	3 065	2 805	2 597
17 FURNITURE AND FIXTURES INDUSTRIES	1 939	2 122	1 831	2 213
18 PAPER AND ALLIED INDUSTRIES	2 145	1 842	2 852	2 059
19 PRINTING AND PUBLISHING	1 556	1 678	1 544	1 855
20 PRIMARY METAL INDUSTRIES	2 323	2 256	2 673	2 050
21 METAL FABRICATING INDUSTRIES	1 939	1 931	2 040	2 080
22 MACHINERY INDUSTRIES	2 044	2 313	2 107	2 254
23 TRANSPORTATION EQUIPMENT INDUSTRIES	2 646	3 006	2 594	2 511
24 ELECTRICAL PRODUCTS INDUSTRIES	2 577	3 959	2 261	2 671
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	1 916	1 931	2 051	2 059
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	5 912	6 207	8 481	2 661
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	2 652	2 649	3 120	2 313
28 MISC. MANUFACTURING INDUSTRIES	2 019	2 292	1 844	2 306
29 CONSTRUCTION INDUSTRY	1 963	2 263	2 383	2 099
30 WHOLESALE AND RETAIL TRADE INDUSTRY	1 313	1 436	1 226	1 621
31 TRANSPORTATION AND STORAGE INDUSTRY	1 756	1 813	1 705	1 915
32 COMMUNICATIONS INDUSTRY	1 336	1 305	1 334	1 466
33 UTILITIES	1 230	1 237	1 350	1 368
34 FINANCE, INSURANCE AND REAL ESTATE	1 434	1 267	1 987	1 404
35 HEALTH AND HOSPITAL INDUSTRY	1 153	1 244	1 429	1 413
36 BUSINESS SERVICES INDUSTRY	1 257	1 319	1 318	1 506
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	1 637	1 787	1 389	2 000
38 OTHER PERSONAL AND MISC SERVICES INDUSTRY	1 408	1 445	1 235	1 693

PREPARED BY: ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A8 SIMPLE MULTIPLIERS (RATIO FORM, WITH LEAKAGES)
BY DETAILED INDUSTRY, 1974

INDUSTRY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY MENT	GROSS OUTPUT
1 AGRICULTURE	1 245	1 328	1 236	1 501
2 FORESTRY	1 788	2 025	1 464	1 974
3 FISHING, HUNTING AND TRAPPING	1 067	1 089	1 058	1 160
4 COAL MINES	1 565	1 262	2 029	1 458
5 PETROLEUM AND GAS WELLS	3 217	1 597	4 003	1 542
6 OTHER MINES AND QUARRIES	1 188	1 388	1 801	1 546
7 SERVICES INCIDENTAL TO MINING	1 156	1 191	1 282	1 365
8 MEAT AND POULTRY PRODUCTS INDUSTRY	7 185	6 804	7 335	2 247
9 DAIRY FACTORIES	2 794	2 988	2 627	1 920
10 MISC. FOOD INDUSTRIES	4 121	4 187	3 961	2 018
11 BEVERAGE INDUSTRIES	1 687	1 621	1 805	1 615
12 RUBBER INDUSTRIES	1 323	1 413	1 393	1 423
13 LEATHER INDUSTRIES	1 894	2 016	1 721	1 860
14 TEXTILE INDUSTRIES	1 375	1 420	1 320	1 382
15 CLOTHING INDUSTRIES	1 201	1 237	1 161	1 219
16 WOOD INDUSTRIES	1 809	1 990	1 947	1 758
17 FURNITURE AND FIXTURES INDUSTRIES	1 281	1 329	1 261	1 342
18 PAPER AND ALLIED INDUSTRIES	1 568	1 409	1 993	1 535
19 PRINTING AND PUBLISHING	1 236	1 271	1 219	1 351
20 PRIMARY METAL INDUSTRIES	1 532	1 487	1 742	1 384
21 METAL FABRICATING INDUSTRIES	1 279	1 270	1 340	1 309
22 MACHINERY INDUSTRIES	1 329	1 402	1 390	1 374
23 TRANSPORTATION EQUIPMENT INDUSTRIES	1 453	1 539	1 474	1 395
24 ELECTRICAL PRODUCTS INDUSTRIES	1 432	1 793	1 376	1 458
25 NON-METALLIC MINERAL PRODUCTS INDUSTRIES	1 526	1 538	1 620	1 628
26 PETROLEUM AND COAL PRODUCTS INDUSTRIES	1 871	5 517	6 611	2 409
27 CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES	1 835	1 856	2 105	1 675
28 MISC. MANUFACTURING INDUSTRIES	1 351	1 411	1 306	1 445
29 CONSTRUCTION INDUSTRY	1 506	1 650	1 739	1 518
30 WHOLESALE AND RETAIL TRADE INDUSTRY	1 227	1 320	1 165	1 453
31 TRANSPORTATION AND STORAGE INDUSTRY	1 513	1 595	1 514	1 661
32 COMMUNICATIONS INDUSTRY	1 [illegible]	1 214	1 210	1 316
33 UTILITIES	1 175	1 186	1 264	1 285
34 FINANCE, INSURANCE AND REAL ESTATE	1 335	1 206	1 747	1 308
35 HEALTH AND HOSPITAL INDUSTRY	1 093	1 156	1 264	1 248
36 BUSINESS SERVICES INDUSTRY	1 196	1 241	1 249	1 387
37 ACCOMMODATION AND FOOD SERVICES INDUSTRY	1 388	1 482	1 231	1 608
38 OTHER PERSONAL AND MISC. SERVICES INDUSTRY	1 269	1 298	1 159	1 475

PREPARED BY ALBERTA BUREAU OF STATISTICS FEBRUARY, 1981

TABLE A9 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY MAJOR COMMODITY, 1974

COMMODITY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 LIVE ANIMALS	739	995	714	1 779
2 GRAINS	739	995	714	1 780
3 OTHER AGRICULTURAL PRODUCTS	737	994	713	1 790
4 FISHING AND TRAPPING PRODUCTS	652	986	733	1 254
5 FORESTRY PRODUCTS	658	939	975	2 392
6 MINERAL FUELS	306	950	201	1 699
7 NON-METALLIC MINERALS	370	956	279	1 868
8 PRODUCTS RELATING TO MINES	306	950	201	1 699
9 MEAT, FISH AND DAIRY PRODUCTS	620	978	594	2 460
10 FRUIT, VEG , FEED & MISC FOOD PROD	613	979	580	2 511
11 BEVERAGES	612	979	578	2 516
12 RUBBER, LEATHER, PLASTIC FAB PROD	613	979	581	2 508
13 TEXTILE PRODUCTS	619	977	599	2 455
14 KNITTED PRODUCTS AND CLOTHING	612	979	579	2 514
15 LUMBER, SAWMILL, OTHER WOOD PROD	612	979	580	2 515
16 FURNITURE AND FIXTURES	613	979	581	2 507
17 PULP, PAPER AND PAPER PRODUCTS	612	979	578	2 515
18 PRINTING AND PUBLISHING	612	979	579	2 514
19 PRIMARY METAL PRODUCTS	612	979	578	2 516
20 METAL FABRICATING PRODUCTS	613	979	580	2 512
21 MACHINERY AND EQUIPMENT	598	977	560	2 478
22 AUTOS, TRUCKS, OTHER TRANS EQUIP	611	977	579	2 491
23 ELECTRICAL AND COMMUNICATIONS PROD	597	976	594	2 099
24 NON-METALLIC MINERAL PRODUCTS	612	979	578	2 515
25 PETROLEUM AND COAL PRODUCTS	497	968	436	2 209
26 CHEMICALS AND CHEMICAL PRODUCTS	612	979	578	2 516
27 MISC MANUFACTURED PRODUCTS	631	975	634	2 345
28 CONSTRUCTION	648	926	533	2 210
29 WHOLESALE AND RETAIL TRADE	710	959	867	1 672
30 TRANSPORTATION AND STORAGE	581	932	598	1 918
31 COMMUNICATION SERVICES	573	972	614	1 482
32 OTHER UTILITIES	525	960	326	1 388
33 REAL ESTATE RENT	393	919	216	1 433
34 FINANCE, INSURANCE AND REAL ESTATE	386	918	203	1 424
35 BUSINESS, PERSONAL & OTHER MISC SVCS	684	963	805	1 725
36 DUMMY COMMODITY I (1)	584	881	615	2 999
37 DUMMY COMMODITY II (2)	561	859	603	2 765
38 TRANSPORTATION MARGINS (3)	581	932	598	2 918

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY ALBERTA BUREAU OF STATISTICS, FEBRUARY 1984

TABLE A10 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES)
BY MAJOR COMMODITY, 1974

COMMODITY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1 LIVE ANIMALS	576	754	558	1 263
2 GRAINS	490	642	475	1 075
3 OTHER AGRICULTURAL PRODUCTS	492	646	477	1 090
4 FISHING AND TRAPPING PRODUCTS	301	158	344	558
5 FORESTRY PRODUCTS	169	650	745	1 679
6 MINERAL FUELS	261	869	163	1 527
7 NON-METALLIC MINERALS	093	260	067	497
8 PRODUCTS RELATING TO MINES	262	869	163	1 529
9 MEAT, FISH AND DAIRY PRODUCTS	360	567	347	1 453
10 FRUIT, VEG., FEED & MISC FOOD PROD	193	309	182	816
11 BEVERAGES	232	372	218	984
12 RUBBER, LEATHER, PLASTIC FAB PROD	071	113	067	298
13 TEXTILE PRODUCTS	023	037	023	093
14 KNITTED PRODUCTS AND CLOTHING	028	046	027	120
15 LUMBER, SAWMILL, OTHER WOOD PROD	192	307	181	812
16 FURNITURE AND FIXTURES	113	229	136	603
17 PULP, PAPER AND PAPER PRODUCTS	085	138	081	365
18 PRINTING AND PUBLISHING	222	357	210	943
19 PRIMARY METAL PRODUCTS	076	122	071	322
20 METAL FABRICATING PRODUCTS	131	210	124	554
21 MACHINERY AND EQUIPMENT	047	078	044	203
22 AUTOS, TRUCKS, OTHER TRANS EQUIP	062	099	059	259
23 ELECTRICAL AND COMMUNICATIONS PROD	051	084	052	176
24 NON-METALLIC MINERAL PRODUCTS	251	407	239	1 077
25 PETROLEUM AND COAL PRODUCTS	352	728	302	1 646
26 CHEMICALS AND CHEMICAL PRODUCTS	123	197	116	522
27 MISC MANUFACTURED PRODUCTS	082	125	084	302
28 CONSTRUCTION	477	651	371	1 533
29 WHOLESALE AND RETAIL TRADE	654	869	814	1 458
30 TRANSPORTATION AND STORAGE	156	731	475	1 470
31 COMMUNICATION SERVICES	528	900	571	1 317
32 OTHER UTILITIES	440	808	267	1 140
33 REAL ESTATE RENT	354	848	184	1 285
34 FINANCE, INSURANCE AND REAL ESTATE	317	773	157	1 166
35 BUSINESS, PERSONAL & OTHER MISC SVCS	582	808	700	1 384
36 DUMMY COMMODITY I (1)	280	394	326	1 787
37 DUMMY COMMODITY II (2)	396	596	441	2 132
38 TRANSPORTATION MARGINS (3)	456	731	475	2 470

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

PREPARED BY ALBERTA BUREAU OF STATISTICS, FEBRUARY, 1984

TABLE A11 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY DETAILED COMMODITY, 1974

	COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	LIVE ANIMALS	734	995	707	1 794
2	GRAINS	734	995	707	1 794
3	OTHER AGRICULTURAL PRODUCTS	733	995	707	1 809
4	FISHING AND TRAPPING PRODUCTS	645	988	727	1 256
5	FORESTRY PRODUCTS	653	935	983	2 374
6	COAL	365	943	276	1 734
7	CRUDE MINERAL OILS	276	946	175	1 684
8	NATURAL GAS	276	946	175	1 684
9	NON-METALLIC MINERALS	318	948	212	1 720
10	SERVICES INCIDENTAL TO MINING	671	969	440	1 569
11	MEAT PRODUCTS	714	985	702	2 637
12	DAIRY PRODUCTS	715	984	718	2 545
13	FISH PRODUCTS	683	973	713	2 488
14	FRUITS & VEGETABLES PREPARATIONS	683	976	678	2 749
15	FEEDS	689	979	686	2 781
16	FLOUR MILL PRODUCTS	689	979	685	2 792
17	BREAKFAST CEREAL & BAKERY PROD	688	978	685	2 781
18	SUGAR & MOLASSES	689	979	685	2 792
19	MISC. FOOD PRODUCTS	689	979	686	2 785
20	BEVERAGES	589	940	558	2 330
21	TIRES & TUBES	608	907	552	2 170
22	OTHER RUBBER PRODUCTS	592	916	535	2 181
23	PLASTIC FABRICATED PRODUCTS	598	952	600	2 297
24	LEATHER & LEATHER PRODUCTS	692	961	804	2 437
25	TEXTILE PRODUCTS	618	962	680	2 356
26	KNITTED PRODUCTS & CLOTHING	582	971	843	2 230
27	LUMBER & TIMBER	683	950	771	2 588
28	VENEER & PLYWOOD	684	950	769	2 597
29	OTHER WOOD PRODUCTS	681	950	764	2 587
30	FURNITURE & FIXTURES	667	951	740	2 238
31	PULP	491	966	421	2 059
32	PAPER & PAPER PRODUCTS	497	966	430	2 057
33	PRINTING & PUBLISHING	625	973	610	1 856
34	IRON & STEEL PRODUCTS	465	794	389	2 052
35	NON FERROUS METAL PROD	460	786	384	2 052
36	BOILERS, TANKS & PLATES	564	932	491	2 084
37	FABRICATED STRUCTURAL METAL PROD	557	922	481	2 080
38	OTHER METAL FABRICATED PROD	571	929	504	2 102

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TABLE A11 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITHOUT LEAKAGES)
BY DETAILED COMMODITY, 1974 -CONTINUED

COMMODITY	HOUSEHOLD INCOME	G D P AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
39 AGRICULTURAL MACHINERY	636	923	584	2 279
40 OTHER INDUSTRIAL MACHINERY	635	923	557	2 202
41 MOTOR VEHICLES	657	913	672	2 513
42 MOTOR VEHICLE PARTS	589	937	544	2 204
43 OTHER TRANSPORTATION EQUIPMENT	632	910	648	2 330
44 APPLIANCES & RECEIVERS,HOUSEHOLD	598	911	573	2 225
45 OTHER ELEC PRODUCTS	636	937	670	2 169
46 CEMENT & CONCRETE PRODUCTS	539	956	469	2 059
47 OTHER NON-METALLIC MINERAL PROD	539	956	470	2 058
48 GASOLINE	368	1 066	251	2 661
49 FUEL OIL	368	1 066	251	2 661
50 LUBRICATING OIL & GREASE	368	1 066	251	2 661
51 OTHER PETROLEUM & COAL PROD	289	960	188	1 805
52 FERTILIZERS	481	951	387	2 313
53 PHARMACEUTICALS	704	983	686	2 713
54 INORGANIC CHEMICALS	471	883	384	2 207
55 ORGANIC CHEMICALS	483	951	391	2 319
56 INDUSTRIAL CHEMICAL PROD	474	930	382	2 284
57 OTHER CHEMICAL PROD	545	959	479	2 459
58 SCIENCE & LABORATORY EQUIP	639	955	681	2 307
59 MISC MANUFACTURED PRODUCTS	609	958	691	2 101
60 CONSTRUCTION	651	906	526	2 099
61 WHOLESALE & RETAIL TRADE	703	957	867	1 646
62 TRANSPORTATION & STORAGE	570	933	588	1 914
63 RADIO & TELEVISION BROADCASTING	569	969	618	1 466
64 TELEPHONE & TELEGRAPH	569	969	618	1 466
65 POSTAL SERVICES	569	969	618	1 466
66 ELECTRIC POWER	523	958	322	1 368
67 OTHER UTILITIES	516	964	328	1 442
68 REAL ESTATE RENT	391	917	214	1 416
69 FINANCE, INSURANCE & REAL ESTATE	385	916	202	1 406
70 HEALTH & HOSPITAL SERVICES	866	974	388	1 413
71 BUSINESS SERVICES	677	964	690	1 546
72 ACCOMMODATION & MEALS	710	961	987	1 984
73 OTHER PERSONAL & MISC SERVICES	598	955	872	1 680
74 DUMMY COMMODITY I (1)	576	861	606	2 832
75 DUMMY COMMODITY I, (2)	560	858	634	2 660
76 TRANSPORTATION MARGINS (3)	570	933	588	2 914

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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TABLE A12 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES)
BY DETAILED COMMODITY, 1974

	COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
1	LIVE ANIMALS	.584	.774	.565	1.335
2	GRAINS	.497	.659	.481	1.136
3	OTHER AGRICULTURAL PRODUCTS	.500	.662	.484	1.153
4	FISHING AND TRAPPING PRODUCTS	.302	.460	.342	.565
5	FORESTRY PRODUCTS	.467	.651	.753	1.692
6	COAL	.280	.794	.200	1.407
7	CRUDE MINERAL OILS	.237	.874	.144	1.541
8	NATURAL GAS	.237	.874	.144	1.542
9	NON-METALLIC MINERALS	.177	.565	.113	1.012
10	SERVICES INCIDENTAL TO MINING	.617	.880	.390	1.366
11	MEAT PRODUCTS	.482	.651	.478	1.833
12	DAIRY PRODUCTS	.418	.555	.428	1.545
13	FISH PRODUCTS	.004	.005	.004	.014
14	FRUITS & VEGETABLES PREPARATIONS	.054	.075	.054	.233
15	FEEDS	.429	.595	.436	1.873
16	FLOUR MILL PRODUCTS	.176	.244	.178	.774
17	BREAKFAST CEREAL & BAKERY PROD	.206	.286	.209	.900
18	SUGAR & MOLASSES	.230	.319	.233	1.011
19	MISC. FOOD PRODUCTS	.091	.126	.092	.399
20	BEVERAGES	.216	.347	.205	.873
21	TIRES & TUBES	.050	.070	.045	.167
22	OTHER RUBBER PRODUCTS	.004	.006	.004	.015
23	PLASTIC FABRICATED PRODUCTS	.151	.232	.157	.562
24	LEATHER & LEATHER PRODUCTS	.028	.038	.034	.098
25	TEXTILE PRODUCTS	.020	.031	.024	.075
26	KNITTED PRODUCTS & CLOTHING	.026	.035	.034	.079
27	LUMBER & TIMBER	.185	.248	.215	.703
28	VENEER & PLYWOOD	.069	.092	.080	.262
29	OTHER WOOD PRODUCTS	.293	.392	.337	1.112
30	FURNITURE & FIXTURES	.147	.200	.170	.457
31	PULP	.024	.049	.020	.102
32	PAPER & PAPER PRODUCTS	.075	.152	.063	.316
33	PRINTING & PUBLISHING	.257	.383	.256	.702
34	IRON & STEEL PRODUCTS	.055	.094	.046	.249
35	NON FERROUS METAL PROD	.048	.082	.039	.218
36	BOILERS, TANKS & PLATES	.203	.333	.176	.713
37	FABRICATED STRUCTURAL METAL PROD	.178	.293	.154	.636
38	OTHER METAL FABRICATED PROD	.081	.130	.072	.284

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TABLE A12 SIMPLE MULTIPLIERS (ABSOLUTE FORM, WITH LEAKAGES)
BY DETAILED COMMODITY, 1974 -CONTINUED

COMMODITY	HOUSEHOLD INCOME	G.D.P. AT FACTOR COST	EMPLOY-MENT	GROSS OUTPUT
39 AGRICULTURAL MACHINERY	010	014	010	035
40 OTHER INDUSTRIAL MACHINERY	065	091	059	216
41 MOTOR VEHICLES	059	079	060	226
42 MOTOR VEHICLE PARTS	028	044	026	103
43 OTHER TRANSPORTATION EQUIPMENT	055	079	058	199
44 APPLIANCES & RECEIVERS,HOUSEHOLD	001	002	001	004
45 OTHER ELEC. PRODUCTS	070	098	077	221
46 CEMENT & CONCRETE PRODUCTS	364	645	314	1 380
47 OTHER NON-METALLIC MINERAL PROD.	107	190	093	.406
48 GASOLINE	300	936	194	2 381
49 FUEL OIL	293	914	189	2 323
50 LUBRICATING OIL & GREASE	249	778	161	1 979
51 OTHER PETROLEUM & COAL PROD	228	815	141	1 522
52 FERTILIZERS	002	004	002	011
53 PHARMACEUTICALS	007	.009	.007	027
54 INORGANIC CHEMICALS	258	489	206	1 257
55 ORGANIC CHEMICALS	067	133	.053	.336
56 INDUSTRIAL CHEMICAL PROD	113	227	089	574
57 OTHER CHEMICAL PROD.	107	188	093	509
58 SCIENCE & LABORATORY EQUIP	090	126	101	.304
59 MISC MANUFACTURED PRODUCTS	073	113	088	.240
60 CONSTRUCTION	499	.661	383	1 518
61 WHOLESALE & RETAIL TRADE	651	871	818	1 457
62 TRANSPORTATION & STORAGE	452	741	471	1 499
63 RADIO & TELEVISION BROADCASTING	526	901	.574	1 315
64 TELEPHONE & TELEGRAPH	526	902	.575	1 316
65 POSTAL SERVICES	526	902	.575	1 316
66 ELECTRIC POWER	498	916	300	1 282
67 OTHER UTILITIES	300	.563	187	825
68 REAL ESTATE RENT	354	850	185	1 284
69 FINANCE, INSURANCE & REAL ESTATE	319	775	158	1 164
70 HEALTH & HOSPITAL SERVICES	701	773	293	1 065
71 BUSINESS SERVICES	612	863	.624	1 347
72 ACCOMMODATION & MEALS	601	796	879	1 593
73 OTHER PERSONAL & MISC. SERVICES	499	795	761	1 355
74 DUMMY COMMODITY I (1)	279	389	.328	1 743
75 DUMMY COMMODITY II (2)	404	.609	480	2 138
76 TRANSPORTATION MARGINS (3)	.452	741	.471	2 499

SEE FOOTNOTE(S) AT END OF TOTAL MULTIPLIERS TABLES

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POOR

QUALITY

ORIGINAL